

The MINING CONGRESS JOURNAL

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Bear witness we are merry."

DECEMBER
1937

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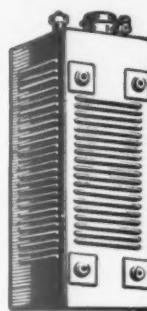


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DECEMBER, 1937

The Mining Congress Journal

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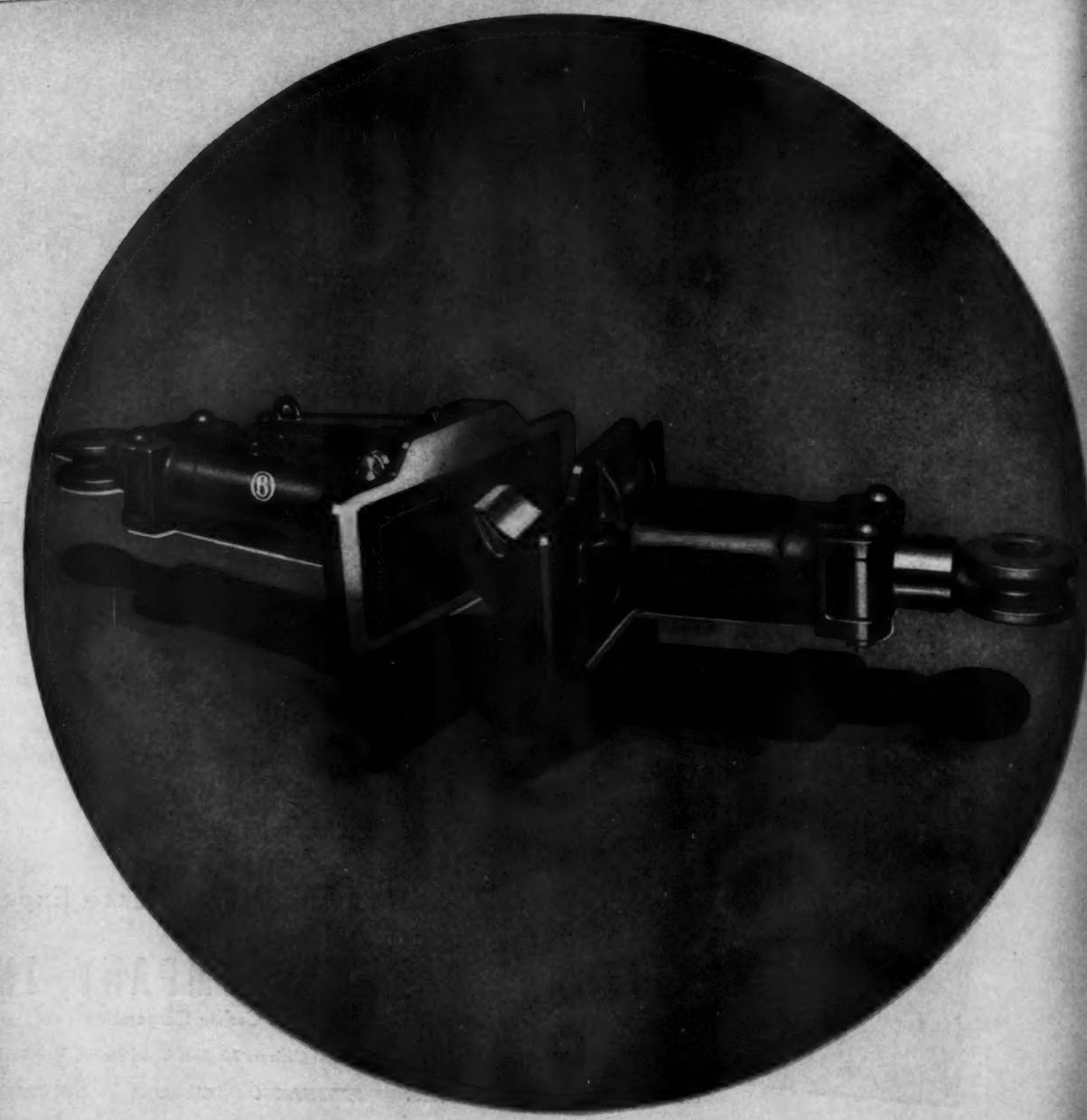
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Ahead of Time

THE critics of the New Deal have hoped that the business recession, which it believed could not be avoided eventually, would not be so severely threatened at this time.

They have believed with the administration that so long as the Government could continue to spend a billion dollars annually in excess of its income, and that double that amount could be distributed regularly to the improvident and the needy, that business could carry the other half of the load and thus the apparent uplift in business conditions could be continued without an increase in unemployment or a break in market price levels.

Disappointment has come to both of these anticipations. Even the President has heard the country wail and is ready now to recommend palliative measures.

With a National Labor Board resolving all labor disputes against the employer, and with no power to discharge incompetent workers or those who are guilty of sabotage because of trumped up allegations that the discharge was for union activities, the employer can see no hope in efforts to enlarge his business and increase employment. His almost certain impulse is to diminish his operations and save part of his capital before more drastic labor demands make it entirely worthless.

If industrial prosperity is to continue the Government must withdraw its cooperation with labor leaders and perform its proper function of seeing to it that both sides to industrial disputes have an equal opportunity in their settlement.

It must see to it that the present intolerable tax burden is reduced and that capital may have promise of a running chance of profit by investment in employing industries.

It must see to it that American manufacturers have an equal chance to sell their output in American markets. It must revise its boasted efforts toward world peace by policies which for the first time in modern history have brought an excess of farm product imports over exports. The trading away of our domestic food markets, no matter what we get in exchange, is no way to increase domestic employment or to encourage domestic productive enterprise. The employment of foreign farm labor instead of our own is not the way to relieve unemployment.

Industrial operators know that executive management is absolutely essential to commercial success. They know that management if surrendered to the labor delegate will destroy all hope of profit therefrom, that one sided labor laws should be repealed and that the Government should take an impartial position in industrial disputes.

A very considerable number of the vociferous supporters of the New Deal is made up of those who are benefited by its lavish distribution of borrowed money.

That beautiful phrase, "divide the wealth," has opened to them a legal way to rob the storehouses of employing capital, and being improvident they will not see that whatever they borrow from tomorrow's income must and will be deducted from tomorrow's or the next day's pay check.

It is now being brought home to them, by the rising price levels, that the money received as wages is fast losing its purchasing value and that somehow, in spite of higher wages, the high living costs brought about by shorter hours, a weakening of executive management and higher wages have made the wage earner's problems more difficult.

Nor has the wage earner yet realized that, in the field of competition with cheap foreign labor, higher production costs have the same result as a reduction in tariff protection by making our home markets easier of access to imported goods. These markets are needed for the products of our own wage earners.

Our present financial and industrial disturbance is ahead of its time and it is hoped that its warning will call for an entire revision of policies which have demonstrated their fallacy.



The Mining Congress Journal



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A Journal for the entire mining industry published by The American Mining Congress

Nationalization of British Coal

RECENT NEWS from Great Britain of the final decision of that government to nationalize all of its coal lands, known and unknown, should be of more than passing interest to all coal operators in the United States. Coming as it does at a time when our own efforts at stabilization of the coal industry through partial Government control are besieged with innumerable difficulties that seem all but insoluble through a variety of causes, many may view Britain's step as a distinct warning of what might some day result here if other means prove unsuccessful.

Briefly, according to the terms of the Coal Bill, issued in Britain November 11 and to be introduced soon into Parliament, all the coal in that country will pass into the ownership of the State on July 1, 1942. Mining royalties will eventually be acquired by the government from several thousand landowners through payments amounting to about \$332,250,000, said to be a little less than half of the value claimed by the owners.

The three principal clauses of the bill provide (1) a plan for unification of coal mining royalties, (2) procedure to effect colliery amalgamations when compulsion is required, and (3) continuance of the present coal marketing set-up with additional safeguards for coal consumers.

Under the first part of the bill, present royalties will continue until the vesting date of July 1, 1942, but a reserve is to be built up out of which any surplus may be devoted to reducing rents that are higher than the district average, and later in reducing rents generally.

Under the second part, the commission is directed to endeavor to reduce the number of coal-mining enterprises and may, under certain conditions, introduce compulsory schemes of amalgamation subject to approval by Parliament.

Under the third part, the present coal-marketing schemes, due to expire this year, are extended until 1942, and a schedule is included aimed at strengthening the protection afforded users of coal. Consideration of consumer complaints of unfair treatment under the organized selling plan will be handled by committees.

Even in this country Government ownership of certain large industries such as railroads and others has been suggested by some of those more radically inclined. Such a program of nationalization, if embarked upon,

might easily extend to the coal mining industry, subject of price-control experimentation at the present time.

It is to be hoped, therefore, that plans involving a maximum of cooperation between the Government and the coal mining industry, and a minimum of actual governmental control may be speedily worked out. Whether the Bituminous Coal Act of 1937 is the answer remains to be seen; but it may behoove all operators to lend their cooperation toward giving it the fairest possible trial, and to use their best efforts to avert something more drastic in the future.

In Defense of a Just Principle

A STRONG CHALLENGE has been made to the statement of the Secretary of the Treasury that percentage depletion should be eliminated from the revenue laws. In an eight-page pamphlet released in October by the American Mining Congress the mining industry flatly denies that the allowance of depletion on a percentage basis constitutes an avoidance or an evasion of tax, and strongly asserts that it is a fair and just allowance to taxpayers engaged in mining.

Briefly, the statement illustrates forcefully that: (1) Depletion is a return to the mining industry of the capital consumed in its operations. (2) The present system of computing depletion resulted from careful study and affords the best means for determining the proper allowance for the annual consumption of capital. (3) Inclusion of the percentage method in the law permits both uniformity and certainty in computing depletion; results in stability of revenue to the Government; provides more equal treatment of those engaged in the industry; makes for economy of administration; protects the small operator; permits use of actual figures rather than estimates, and provides only a fair return of invested capital to the industry.

The following important point is made:

"In 1936, when the proposed tax upon undistributed earnings was under consideration by Congress, Treasury officials repeatedly stated that the mining industry had nothing to fear from the adoption of this new principle of taxation, as they had their allowance for depletion under the percentage system which would provide funds for exploration and development. The Treasury officials at the same time specifically assured the industry that

they did not propose to disturb this allowance. Now, with a tax upon undistributed earnings which makes it almost prohibitive to retain them in the business, with increased difficulty in securing new capital under the administration of the Securities Act as applied to mines, the Treasury proposes to eliminate the one fund which might be relied upon for replacing exhausted bodies of minerals."

The principle of the percentage depletion provision has been repeatedly considered not only by the committees of Congress charged with framing our revenue laws but on the floor of both Houses. Each time its retention in the law has been found eminently justified for the reasons stated above. Nothing has now developed which was not thoroughly set forth and given the fullest consideration in these earlier hearings. The existing system of depletion has been found, after mature deliberation, to be the best and fairest method of recognizing the annual consumption of capital in the mining industry, and no valid reasons have been advanced to show why it should now be curtailed.

Production of metals and fuels is vital to our modern civilization. Allowances for depletion of mineral deposits, based on the principle of continuity for this basic industry, should not be disturbed. Consideration of such action at this time can only add further to the uncertainties and difficulties facing the mining industry at this critical stage.

The pamphlet summarizes the position of the mining industry in the following words:

"We submit that the provisions of the present law are fair and equitable, that they permit of substantial savings in expense to both the Government and the taxpayer, that they protect the small operator against discrimination and the taxation of his capital, that they return no more to the industry than its annual consumption of capital, and that they constitute the best procedure yet devised for recognition of the capital continuously invested in an industry necessary to the welfare of the nation."

Half Done But Well Done

COMMENTING ON A BRIEF dispatch from the Department of the Interior to the effect that the United States Geological Survey now has the United States nearly half mapped, a recent editorial in the *New York Times* pays a fitting tribute to the work that has been done by Government surveyors and draftsmen since inception of the work in the '70's. It is written, of course, from the viewpoint of the layman who benefits directly only in a very limited way from availability of these excellent topographic maps—on vacation tours and camping trips. To the mining engineer and geologist they signify a far more practical utility; but read what the layman philosopher says:

"... Did the reader, remembering his bouts with school geographies or thinking of the flood of highway guides that may now be had from almost any filling station attendant, think that the country was all mapped? If so, he was wrong. The U. S. G. S. has run its contour lines hither and yon, from the Sierras to the valley of the Kennebec, but its life mask of America builds up slowly.

"Well, there is plenty of time. The face of the earth changes somewhat. We slice it and smear it to make our great railways and highways. We cut the forests and let its integument wash down into the rivers. We

plant and plow where nature does not wish us to do so, and the epidermis of a large area of our native land blows away. Still, the shape of the country remains about what it was. It can wait until the surveyors, perhaps two generations hence, run the last contour line and ride slowly back to camp.

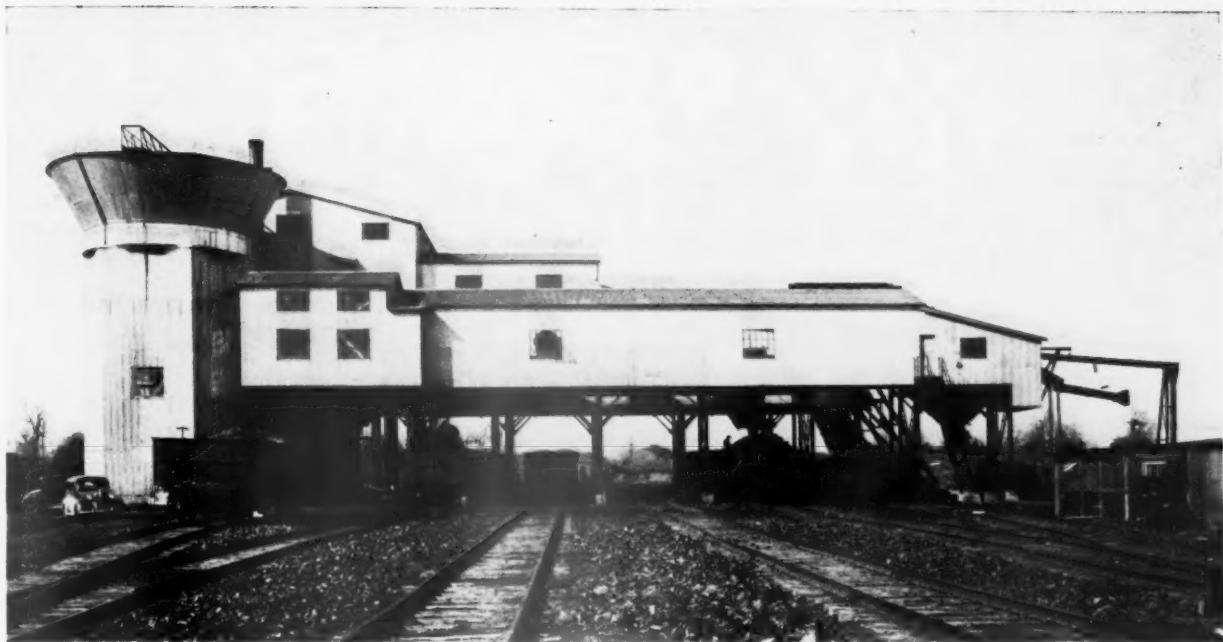
"Plenty of time! Custer falls at the Little Big Horn—the work is just beginning. Garfield is shot—the sunburnt surveyors are riding across the prairie. Blizzard of '88, first Chicago World's Fair, opening of Oklahoma, Bryan and free silver, war with Spain, coming of the automobile, coming of the motion picture, war with Germany, the big boom, coming of the radio, Wilson, Harding, Coolidge, Hoover, Roosevelt, Old Deal, New Deal—the U. S. G. S. keeps right on surveying, expanding a little when Congress is generous, contracting when Congress has a fit of economy. Across the prairie and over the mountains, hanging on to rocky cliffs, breathing the dust of the desert, going back to camp at night at a hard trot that is supposed to be good for the liver—the veterans of the old spacious days of the U. S. G. S. could feel themselves lords of all they surveyed.

"And their maps! Who that has ever spread out a U. S. G. S. map upon the kitchen floor, upon the needles under a pine tree, upon a flat rock at the crest of a ridge, will forget the thrill those maps can give? Here the north fork emerges; follow it up; better keep to the western side, which isn't so steep; here is a mountain meadow, good water and good camping; tomorrow—well, the U. S. G. S. maps have ever been full of tomorrow. Reading them carefully one can learn to love one's country—not just its history, its traditions, the Supreme Court, the Bill of Rights, but the dear physical face of the land."

To thousands of engineers and geologists—not only in connection with mining but also in connection with highway, railroad, dam and innumerable other types of construction work, as well as to those engaged in soil conservation pursuit and in teaching—the maps serve a much more practical purpose. With these available as base maps, other features are plotted with comparative ease.

By careful examination of the contours and other features portrayed, the well-trained professional man oftentimes can conclude: "This little knoll or flat ridge should be a very promising area to explore for gravel deposits;" or "Here is roughly the route we must follow with the proposed highway over the mountains;" or "These surface features are a warning that considerable leakage may be anticipated from the reservoir;" or "Judging from topography these localities should be the ones to investigate carefully for the location of the proposed dam." These are only a few of the myriads of practical uses involving a saving of time and money to which the U. S. G. S. maps are constantly put. It is only when field work requires investigation of a previously unmapped area that one fully realizes the utility of a topographic base map.

In recent years rapid advances in technique of aerial photographic mapping have aided greatly in speeding up and improving many phases of plotting surface features of the land on paper. The U. S. G. S. is making use of these new methods in several areas now being mapped, and if recommendations of the Secretary of the Interior, in response to a Senate resolution at the last session, are carried out, we can doubtless look forward to completion of the second half of mapping, which will then give us an unbroken string of contours over the entire country, in a much shorter time than was required to accomplish the first half.



Preparation Plant of Binkley Mining Company of Missouri, near Macon, Mo.

PREPARATION of "BEE-VEER" COAL at New Stripping Operation

By C. F. HAMILTON *

THE newly opened stripping operation of the Binkley Mining Company of Missouri is located near Macon, Mo., and operates in the Bevier Seam, with an average thickness of 4 ft. throughout the property. Modern equipment of the latest design has been installed, including a 950-B Bucyrus-Erie electric stripping shovel with 30-cu.-yd. dipper and an 85-B loading shovel with 5-cu.-yd. bucket. Four 25-ton bottom-dump trucks haul the coal to the preparation plant, which converts 400 t.p.h. of mine-run coal into six finished grades of "Bee-Veer" fuel, with provision for re-assembling any or all grades. Normal loading is to railway cars on six tracks, with optional delivery of any grade or mixture to locomotives, for fuel, or to custom-coal trucks. An adjustable primary breaker controls the maximum size of coal to be handled through the plant.

* Vice President in Charge of Operations, Binkley Coal Co.

Auxiliary circuits provide for optional crushing and resizing after cleaning.

It was originally intended to wash only the 3-in. x 0 raw coal together with crushed boney from the picking tables and crushed middlings from the stove-nut-pea washer. However, it was later decided to include the 6-in. x 2-in. egg coal in the feed to the washers because of more efficient preparation and lower cost. Screen plates were changed in the raw-coal screen, raw-coal belt speeds increased, and the washed-coal screen altered to include the 3-in. size separation. A conveyor was installed to transfer the washed egg to the egg loading boom, one recirculating pump was replaced by another of greater capacity, and a few minor adjustments were made on the washers for treating the extended size range. At the completion of these changes, the washers handled the increased tonnage with no apparent drop in efficiency.

The present operation of the plant is indicated by the accompanying flow diagram. The trucks dump the mine-run coal into a 100-ton hopper, from which it is delivered by a three-position adjustable reciprocating feeder into the primary breaker. This is a double-roll unit, the roll spacing of which may be readily adjusted for a maximum product of 8-in. to 18-in. The broken product is deposited in the bottom run of the run-of-mine scraper conveyor, which is inclined upward and discharges onto the raw-coal screen. Of conventional declined shaker type, in two opposed balanced sections, this screen is supported by pivoted hangers and actuated through rigid pitmans from spherical eccentrics. It was originally surfaced with 6-in., 3-in., and 1 1/4-in. round-hole perforated plate, delivering 6-in. lump and 6-in. x 3-in. egg directly to their respective picking tables. On the present operating basis, everything under 6-in. goes to the

two raw-coal belts, but the arrangement is such that all or a part of the 6-in. x 3-in. may still go to the egg picking table if it should ever prove desirable.

The lump picking table is of the apron type, with flat-top pans, and consists of a fixed horizontal picking length and a hinged loading-boom section. The egg picking table is of the reciprocating type, slightly declined, supported by flexible boards and actuated by an eccentric. It discharges onto an apron-type hinged loading boom. Two sets of picking pockets are provided for each table, one set being connected by chutes with a malleable iron drag chain conveyor which transfers the "pure" refuse to the main refuse belt. Laminated material or "boney" is picked into the other set of pockets and collected by a second drag conveyor for return to the ROM scraper via the boney crusher. This is a standard single-roll unit, but is equipped with Ni-Hard alloy crushing staves and back plate. Rescreening plants in the lump and egg deliveries from the raw-coal screen drop any degradation material into a short spiral conveyor, which transfers it to the boney drag for return to the raw-coal circuit with the crushed pickings.

About 350 t.p.h. of raw coal under 6 in., together with rescreenings, crushed boney, and crushed middlings, is fed by the raw-coal belts into launders through which it is flushed hydraulically to the two coal washers. At the present time one washer treats 6-in. x 2-in. and the

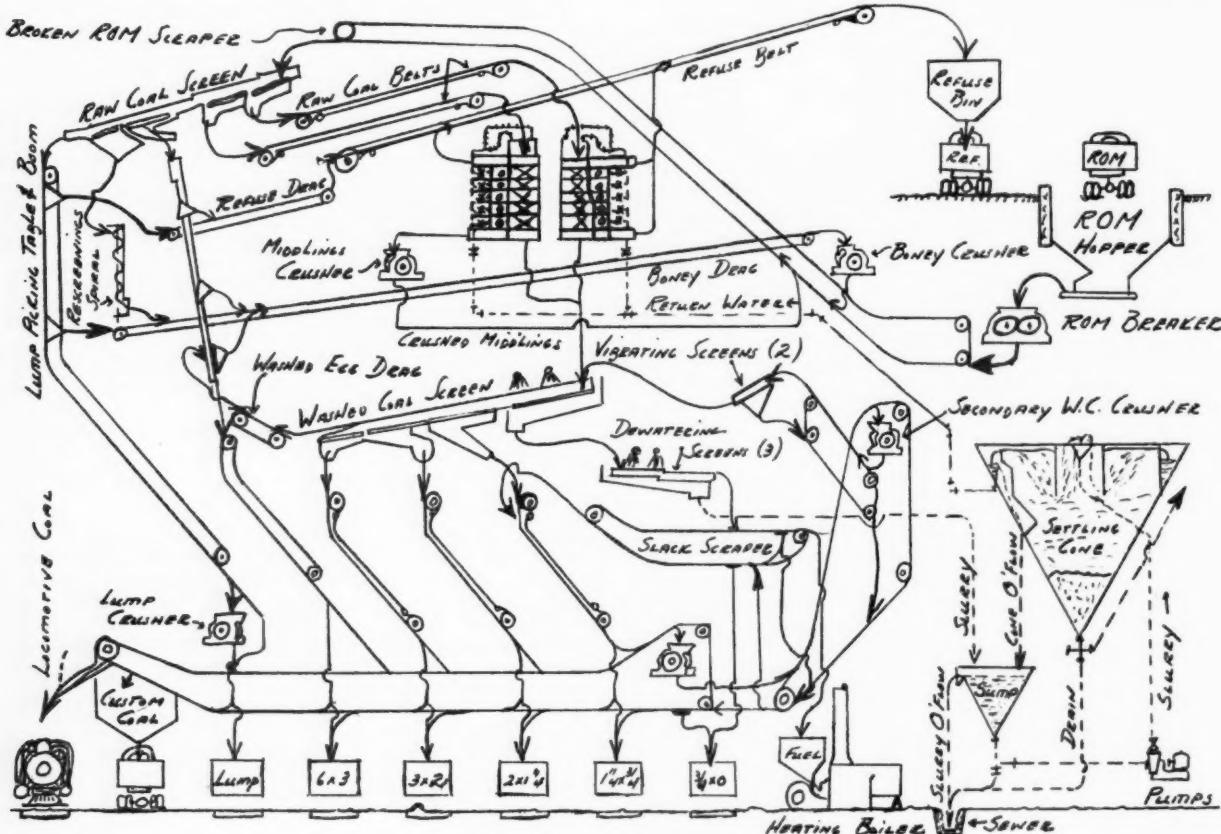
other 2-in. x 0. They are impulse washers, or jigs, of the Baum type, in which the washing impulse is effected by the expansion of compressed air. Each has its own air receiver and turbine-type compressor, and each consists of five treating cells, so arranged as to constitute two primary or roughing stages and three secondary or final stratification stages. The jiggling action stratifies the bed into horizontal layers on a densimetric basis, with the lightest, purest coal at the top, where it may flow out with the water. The heavier material collects at the bottom, whence it is evacuated into the refuse wells, at each end of each washer, by means of patented undercut ejection gates. These gates cannot be clogged, regardless of the size of the coal, and are pneumatically operated, their action being automatically regulated to maintain a constant depth of refuse bed, of predetermined specific gravity. Counterpoises sliding on graduated beam arms of the automatic control mechanism provide for changing product quality without disturbing other operating adjustments.

Cast-iron spiral conveyors in the bottoms of the wash boxes collect the so-called "hutch" material, or fine refuse passing through the supporting screens of the washing compartments, and deliver into the refuse wells. Elevators, with perforated buckets for dewatering, are mounted in each of the four wells. Both elevators of the washer treating the smaller coal and the primary ele-

vator of the egg-coal washer discharge through spouts to the refuse belt for transportation to the 50-ton refuse bin, together with the hand-picked refuse. The refuse bin is conform, with 60° sloping bottom, and is provided with gate and chute for loading into trucks. Secondary rejects (middlings) from the egg-coal washer spout by gravity to the run-of-mine conveyor, passing through the middlings crusher. Like the boney crusher, this is a single-roll unit with alloy wearing parts.

Screening and Dewatering

Washed coal from both washers launders hydraulically to the wash-coal screen. This unit is of semi-flexible construction, consisting of two opposed rigid sections, supported by flexible hangers and driven by spherical eccentrics through flexible pitmans. Its declination is somewhat less steep than that of the raw-coal screen, and its speed greater. Surfaced originally with 2-in., 1 1/4-in., and 3/4-in. perforated screen plates, this screen has now been provided with a short auxiliary deck at its discharge end, making a 3-in. size separation. Washed 6-in. x 3-in. slides off the end of the screen onto a short drag conveyor which transfers it to the egg loading boom, at the end of the egg picking table. The 3-in. x 2-in. stove, 2-in. x 1 1/4-in. nut, and 1 1/4-in. x 3/4-in. pea coal deliver from the screen to their respective loading booms, of the belt type. Slack coal, together with the wash water, passes through the



Flow diagram of Binkley preparation plant.

$\frac{3}{4}$ -in. screens and flows to the dewatering screens. There are three of these units, each consisting of two balanced horizontal sections, suspended by inclined flexible hangers and actuated in opposition through flexible pitmans from high-speed eccentrics. They are surfaced with imported wedge-wire screen, with continuous slot openings $\frac{1}{2}$ -m.m. wide. The dewatered $\frac{3}{4}$ -in. x $\frac{1}{2}$ -m.m. slack is collected in the top run of the slack scraper and may discharge over the end sprockets into the fuel bin of the heating boiler, may transfer to the bottom run of the primary crushed coal scraper, or may drop through to its own bottom run. From the bottom run it may load by chute into cars on the slack track or may be deposited upon the pea-coal loading boom.

The mixing conveyor is of the scraper type, carrying on both runs, extending across the six loading tracks and the truck road. The bottom run may receive any or all prepared grades, crushed or uncrushed, and loads optionally to cars on the loading tracks, through slide gates and loading chutes; to trucks on the roadway, through a small custom coal bin with cut-off gate and truck chutes; or to locomotives on the bypass track through a hinged coaling spout. All booms may deliver into the bottom run, which may also receive the slack via the pea boom or the primary crushed coal scraper. The lump boom also delivers optionally to the single-roll lump p

crusher, the crushed lump dropping into the bottom run of the mixing conveyor. All booms except the lump boom also have the option of the delivering into the top run of the mixing conveyor, which feeds the primary washer coal crusher. This is a heavy-duty single-roll unit and its product may drop through to the bottom run of the mixing conveyor, completing the flexibility of that unit.

Normally, however, the crushed coal is elevated by the inclined primary crushed coal scraper conveyor to the secondary washed coal crusher. This is a single-roll unit with double-hinged back-plate, comprising two separately adjustable crushing stages in a single unit. The combination of the primary and secondary crushers, incorporating three independent crushing adjustments, affords a wide range of reduction possibilities. The product of the secondary crusher is distributed by the top run of the secondary crushed coal scraper over two vibrating screens making a $\frac{3}{4}$ -in.

separation. The $\frac{3}{4}$ -in. x 0 is collected in the bottom run of the same conveyor and transferred to the bottom run of the primary crushed coal scraper, from which it may deliver to the bottom runs of the slack scraper or the mixing conveyor. Oversize, if any, from the vibrating screens is assembled with the uncrushed washed coal in the washed-coal launder, for resizing and redistribution by the washed-coal screen. At times the entire mine output is reduced to $1\frac{1}{4}$ -in.

Settling Cone Reclaims Fines

Slurry, consisting of wash water and $\frac{1}{2}$ -m.m. fines, passing through the wedge wire of the dewatering screens, flows to the pump sumps. There are two of these, conical in form, with suspended internal baffles to prevent formation of vortices, and with overflow wiers and enclosed flumes to the sewer. The bottom of each sump is connected with the suction flange of one of the two recircu-

the annular clean-water channel outside the circular wier, whence it returns by gravity to the washers for reuse. The elevation of the cone establishes the necessary head, which is maintained constant by means of a fixed overflow wier and a continuous overflow to the pump sumps. Each washer has its own distributing header, with branch outlets and regulating valves for each washing compartment and for each side of the raw-coal launders for the introduction of the necessary flushing water. Gate valves provide for independent regulation or interruption of the water supply to each washer without disturbing the proportionate distribution to the washing cells and the launders.

The fine solids, settling out, collect in the bottom or apex of the cone and are drawn off as sludge. The hydrostatic head in the cone above the sludge provides sufficient pressure to force it upward through an inclined pipe, which discharges into an elevated, slightly declined trough leading to the sludge disposal acreage. The cross fitting at the bottom of the cone is provided with a drain cock and drain pipe to the sewer, and with a special Ni-Hard fitted gate valve for regulating the sludge flow. The cross is also connected with the fresh-water piping circuit, both for flushing out the sludge system with fresh water, under pressure, and for controlling the pulp density in the sludge line. Such water as flows out with the sludge

passes over the sludge pond dam completely clarified, and returns to the fresh-water supply pond. The total rejection from the plant, including the discarded sludge, is approximately 20 percent of the ROM input.

Water Pumped 6,500 Ft.

All "make-up" water is added to the circuit in the form of fresh-water sprays on the finished products. Slotted nozzles are mounted in line along the spray headers, so spaced that their fan sprays overlap to form a continuous thin-sheet spray at relatively high pressure. Two such spray lines extend across the $\frac{3}{4}$ -in. washed-coal screens, beyond the passage of the wash water through the screens. Two more such sprays extend across each of the three dewatering screens, beyond the "pools" of dirty wash water. These sprays remove all discolored water and adhering fines from the coal, insuring shiny black appearance after drying.

(Continued on page 42)



End view of plant, showing delivery of raw coal by 25-ton Austin-Western trailer units.

lating pumps. These are single-side suction centrifugal type, especially developed for coal washery service. Construction is extremely rugged throughout and all parts in contact with the slurry are of Ni-Hard alloy and readily renewable. Quickly detachable expansion joints in the suction lines greatly facilitate the replacement of these wearing parts. A throttle valve is installed at the discharge nozzle of each pump, for separate volume control. Beyond the valves the two discharge lines combine in a common header, leading through the sloping side of the conical settling tank and delivering in a free cascade above the water level in the cone, inside a perforated cylindrical curtain. The settling cone is 40-ft. in diameter with 60° sloping sides, and is fitted with a peripheral outflow wier, insuring uniform radial flow at minimum velocity and consequently optimum settling conditions. As the solids are precipitated, the water flows out into

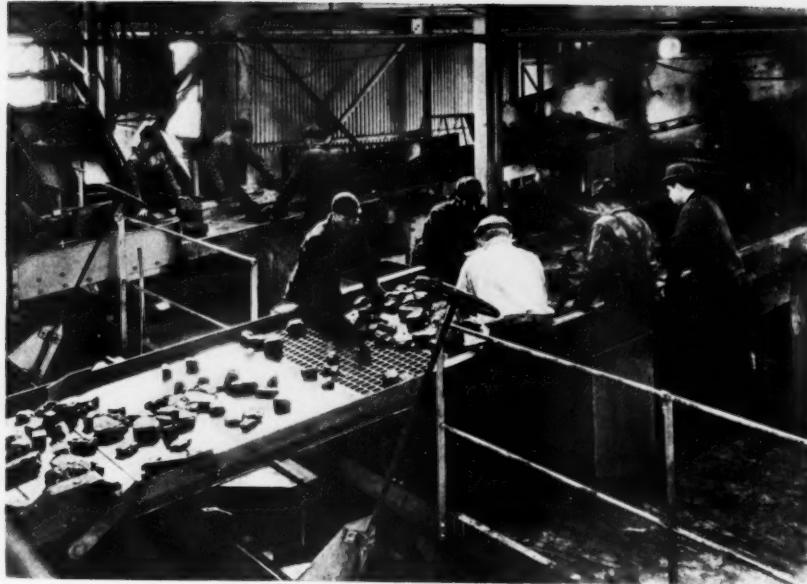
SORTING or selection is an important part of the concentration of mineral, rock, or ore. Sometimes it involves picking out the high-grade materials (selection) and sometimes it consists of picking out and discarding barren rock (sorting). The writer has done some sorting, has observed it at many small and large mills and at scrap-yards, and has noted it while reading descriptions of mines and reduction plants.

Sorting is an old method of separating valuable minerals from valueless rock. It should be given serious consideration at every mine and works. Why? Because if an ore is adaptable to sorting, at low cost (a few cents a ton) the grade is improved, deleterious minerals may be discarded, and less worthless material has to be handled with consequent saving in expense in hand-shoveling, mechanical loading and hauling in ore-cars, vehicles, and railways. These are operating factors that affect costs. Some engineers have never seriously considered sorting. Three well-known mines—Alaska Juneau, Howey, and Yellow Aster as examples—find sorting to be all important.

Book VIII of *De Re Metallica*, by Georgius Agricola, translated from the Latin by Herbert C. Hoover and Lou H. Hoover, has three pages, with a sketch on each, describing sorting in the 14th century. He says in part:

Experienced miners, when they dig the ore, save the metalliferous material from earth, stones, and solidified juices before it is taken from the shafts and tunnels, and they put the valuable metal in trays and the waste into buckets. But if some miner is inexperienced in mining matters has omitted to do this, or even if some experienced miner, compelled by some unavoidable necessity, has been unable to do so, as soon as the material which has been dug out has been removed from the mine, all of it should be examined and that part of the ore which is rich in metal sorted from that part of it which is devoid of metal, whether such part be earth or solidified juices, or stones. To smelt waste together with an ore involves a loss, for some expenditure is thrown away, seeing that out of earth and stones only empty and useless slags are melted out, and further, the solidified juices also impede the smelting of the metals and cause loss. ***

* Metallurgist-Journalist, Washington, D. C.



Modern coal picking tables.

SORTING

By M. W. VON BERNEWITZ *

Waste or discard may even be usable or marketable—rejected quartzite as a grinding medium, fine quartz for concrete, or coal pyrite as a source of sulphuric acid, for example.

Sorting may mean the picking out and discarding of waste without breaking any rock, rejecting waste after breaking the rock, or cobbing and selecting marketable minerals from their enclosing rock, such as is commonly practiced in the asbestos, fluorspar, and mica industries.

Where sorting is practiced, the discard should be examined or sampled and panned, assayed, or analyzed to check the work to show that nothing treatable or usable is being rejected. The waste thrown out by experienced sorters at some mines is of less value than the mill tailings. At other mines it is practically similar or perhaps somewhat higher. This constitutes good work.

Whether sorting is done or not, attention at all mines should be given to the dry fines, the wet fines and the sludge from washing operations. Generally these are valuable, frequently more so than the original ore. Therefore, fines should also be examined and sampled for mineral determination. Occasionally the fines are of lower grade than the coarse rock and may be dumped or milled as desired.

Ores, and coal, are or may be given a rough sorting underground. The waste is hoisted and dumped or it is built into dry walls or used as filling in the mine. The ore may be given a second sorting at the surface on the crusher floor, or after being crushed. Frequently the ore is washed after crushing to enable the sorters to see better the minerals and gangue. Some minerals, asbestos for example, should not be washed.

Some ores are sorted only at the surface, where they are crushed and washed.

Other ores are crushed or cobbed, washed, and sorted.

Ores in which such minerals as copper, gold, pyrite, and tellurides are disseminated or well scattered are unsuited to sorting.

Where narrow veins are mined and the ore is diluted with wall rock, the waste should be sorted out; but where veinlets traverse the country rock, especially in all directions, little or no sorting is possible and the whole must be milled.

Sorting is done on platforms from which ore is shoveled or raked into breakers, on platforms below breakers, on flat rotating tables, or on one or more slowly traveling belts. Shaking or rotating screens and grizzlies form part of some flow-sheets. As a rule, the waste

is scraped off and dumped down chutes, the ore passing on into bins, thence to crushers and mills.

Because of the variety of ores and because millmen and smeltermen may not know their individual characteristics, sorting is seldom done at custom plants. But probably many such shipments have been previously sorted.

Sorting belts vary in speed, but up to 100 ft. or so per minute gives ample time to look over the ore and waste and not overlook anything.

Prospectors and miners working for themselves will often find that the throwing out of waste, poor rock, impurities, or minerals for which a penalty is exacted at custom plants, is profitable work.

Men become expert at sorting after receiving proper instruction regarding what is rock and what is ore, including the common minerals. Sorters should be provided with finger stalls or pads or with good gloves to prevent fingers and hands from being cut, roughened or scratched, and perhaps infected. Cheap cotton gloves have no life, but leather ones costing say \$2 do last. Some men wear rubber aprons to keep off splashes. Hard-toed boots, costing about \$3, are a safeguard against injury through dropping large pieces of rock. Mining companies can and do purchase this protective clothing and sell it at cost to the men. Good direct lighting is also important.

The range of waste sorted out lies between 5 and 50 percent of the ores mined; coal rejected by hand work ordinarily is less than 5 percent. An enormous tonnage of metallic and non-metallic minerals is sorted through the world each year, some of it casually, but much of it systematically.

Sorting Practice

Following are short descriptions of sorting operations, largely from the

writer's observations, but items on a few of the minerals are based on publications of the American Institute of Mining and Metallurgical Engineers, *Engineering and Mining Journal*, and United States Bureau of Mines. It may be added that although technical publications mention sorting, many of the indexes are as scant on the subject as they are on sampling. Peele's and Taggart's *Handbooks* give some space to sorting. Oliver Bowles, Robert Ridgway, and W. E. Rice, of United States Bureau of Mines, read this paper and offered suggestions.

Asbestos.—Asbestos-bearing rock is sorted in two ways: Where the veins are wide enough to furnish spinning fiber (crudes) the rock is hand-cobbed and the high-grade fiber sorted out on the quarry or mine floor. The sorting of rock that is to be milled consists of picking out barren fragments that contain few or no fiber veins. In Russia hand-picking is followed so extensively that only one-fourth to one-fifth of the rock quarried is sent to the mill, and the grade of the ore is raised from 6 percent to about 22 percent.

Barite.—This mineral is more or less sortable. Whether sold as lump or as concentrates, the crude ore is improved by picking out barren or poor material.

China Clay.—This material requires hand picking in pits and before being ground.

Chromite.—Like asbestos, chromite is found in serpentine. In some deposits the ore is clean and high grade, and in others it is diluted with country rock which must be removed. Where the chromite is disseminated it is not sortable and must be concentrated. In all grades the silica must be low. The market desires 36 to 50 percent ore. Lump chrome ore for refractories is carefully selected. The writer has examined and sampled a number of chromite deposits in California similar to those mentioned. Careful

sorting is recommended for the massive ore of the Stillwater area of Montana.

Cool.—Some "picking" or sorting of coal is done underground, where the large pieces of slate, bone and pyrite are built into walls or stoppings, or they are hoisted to the surface and dumped. Here again some picking is done on belts and tables. At washeries the plus 4 to 6-in. coal is picked over. If enough lump pyrite is present, as in the east-central States, this may be sold to acid makers. A large proportion of the 490,000,000 tons of coal mined in the United States during 1936 received some attention from hand pickers. No general figures of refuse are available, but the range is 0.5 to 6 percent of mine-run output, with up to 2 percent on large tonnages in certain districts. Hand-sorting problems at the face and at the tipple form a proposed investigation of the A. I. M. E. Committee on Bituminous Research Planning.

Copper.—Copper occurs in a great variety of minable forms, some ores containing several minerals, but generally each ore is fairly distinct. Rock stained with copper is deceptive as to value. Quartz with chalcopyrite and more or less pyrite is usually sortable. If wall-rock is intermixed, it can be picked out on a belt, although the fines therefrom pass on with the ore. Massive chalcopyrite, pyrite, and pyrrhotite, as at Noranda, Quebec, is not sortable. Chalcocite disseminated through porphyry with pyrite, as in numerous large operations in Arizona, Nevada, New Mexico, and Utah, is not sorted but is milled as is. In a recent review of milling practice at 16 large copper mines, sorting is not mentioned.

Feldspar.—This mineral is found in pegmatites and is sortable by breaking off quartz, mica, garnet, or other gangue after the rock has been mined. Mica is sometimes a by-product. First grade spar is first selected and other sorting may be done on belts.

Fluorspar.—The gangue of fluorspar may be calcite and quartzite, and the metallic minerals galena and sphalerite. The purer fluorspar may be selected by cobbing and the remainder crushed, washed, and the waste removed.

Gemstones.—Hand sorting is an important part of the recovery of gemstones from alluvials or placers and from their containing formations. When mining the latter, care must be used not to damage the stones. Diamonds, emeralds, opals, rubies, sapphires, tourmalines and other gemstones are sorted and selected.

Gold.—Gold occurs in such a variety of rocks and with so many minerals that only a few examples of sorting may be given.

The simplest ore is free gold in white quartz, much of which can be safely discarded after a man knows such ore. Quartz in which there is a little free gold and the remainder enclosed in coarse pyrite is suitable for sorting. Ten percent or more may be rejected as is done at a mine in Virginia.

A quartz in which the gold occurs in



Sorting in the 14th Century, according to Agricola (Hoover).

fractures, with a little pyrite and galena, can be sorted with care. At the London mine, Colorado, the quartz contains some free gold, but it is found mostly in galena and pyrite. It is washed on a 1-in. screen and the oversize is sorted.

Along the Mother Lode of California, fine and coarse gold occurs in quartz with pyrite, also a little galena, arsenopyrite, and pyrrhotite. No sorting is done, yet it might be possible to reject barren quartz, slate, and schist.

At Yellow Aster, California, the gold is free and fine in soft granite and in fractures and joint planes therein. The ore is crushed and screened, the plus 2 1/4-in., which is relatively barren, being discarded. This amounts to 23 percent. To this is added the 30 percent rejected in the mine, a total of 46 percent when the tonnage of the two classes of ore are averaged. The recovery from more than 3,000,000 tons of ore has averaged 0.167 ounce per ton.

Alaska Juneau is often cited as a splendid example of efficient sorting done at low cost. The ore is quartz with a gangue of dark colored diorite. It carries pyrite and galena. The first sorting is on 4-in. ore, which is crushed and resorted. As much as 55 percent has been discarded. In 1936, 44 percent of 4,366,800 tons mined was dumped assaying 0.0069 ounce per ton. Tailings of the 2,462,000 tons milled averaged 0.0089 oz. per ton. In 1931, the cost per ton rejected was 3.27 cents and per ton milled 1.38 cents.

The Howey mine, Ontario, is reported to have ore similar to that of Alaska Juneau. Any rock that does not show quartz or sulphides is wasted. Six to 14-in. rock is sorted. No sledging is done. Eighteen percent of 41-cent waste is sorted at a cost of 4 1/3 cents per ton. Mill tailings assayed 22 cents per ton.

calcite, with gold free and in pyrite and galena. Other sulphides are present. A 2 1/2-in. crusher and washer product was hand sorted.

The gangue of the Hog Mountain mine, Alabama, is quartz-diorite and quartz. Gold is fine and associated with sulphides, largely chalcopyrite. Unless the ore is drawn from sheared zones all the granite is wasted. All the 1-in. ore is screened and the oversize washed and sorted. The fines are saved. The sorting belt is short and travels at slow speed. Picking costs 5 cents per ton milled, and the reject amounts to 7 to 10 percent.

The basket of the Rand, Transvaal, which lies in narrow reefs or veins in quartzite, is ideal for sorting. The gold, which is fine, occurs in the cementing minerals of the conglomerate. Last year 48,000,000 tons were milled. In general there is some sorting below, and the remaining ore is separated into coarse and fines on a grizzly. The fines pass to the stamps or ball-mills, and the oversize is washed and sorted. The fines from washing are mixed with the other fines. Twelve to 15 percent of the ore hoisted is sorted at a cost of 1 1/2 to 5 pence or 3 to 10 cents per ton. Tailings or waste assay 3/4 pennyweight. Some of the reject is used as grinding material in the mills.

The quartz ore of the Kolar gold field, India, is sorted to the extent of over 10 percent. This costs around 6 cents per ton milled.

At Waihi, New Zealand, the gold in the Martha mine is extremely fine, and silver occurs as argentite. The veins lie in rhyolite and no sorting is done; but the writer, who was there recently, believes that washing and sorting might be done.

On a 1,000-ton a month basis it cost

Ontario district no sorting is done at the Lake Shore, but at the Toburn 13 percent (porphyry, graywacke, and quartz) is removed from a belt which feeds a jaw-crusher. Altaite is the principal telluride. . . . In the Colorado field where large quantities of ore has been sorted, and dumps are being sorted, the Cresson has sylvanite and calaverite in quartz, fluorite, and basaltic breccia. An average of 35 percent is discarded, assaying 1 pennyweight per ton. The mine run is doubled in gold content. A man can sort 15 tons a shift at a cost of 35 cents per ton milled. . . . In the Western Australian field, the calaverite, sylvanite, and pyrite are so scattered through the quartz-dolerite that sorting is not feasible. Assays only reveal which is ore and which is country rock—largely greenstone or diorite.

Graphite.—Of the two varieties of graphite—flake and amorphous or vein—only the latter can be hand sorted. Sometimes it is found in pocket accumulations and needs little attention. Otherwise the vein graphite is suitable for sorting.

Iceland Spar.—The clay in which this optical mineral is found is carefully worked by hand to take out the spar crystals.

Iron.—The impurities that lower the grade of iron ores are clay, silica, phosphorus, and sulphur. These are reduced in quantity by screening and washing, but some ores, particularly magnetite, may be belt-sorted after screening. High-grade lump is selected and is in demand for open-hearth furnaces. In some pits waste is removed by hand methods.

What are known as the "black ores" of Minnesota, an intimate association of iron (hematite), manganese (manganite), and silica, cannot be sorted. The minerals and gangue are similar in appearance.

Lead.—Galena is the principal lead mineral; but other sulphides are associated with it—commonly sphalerite and pyrite. Relatively little sorting of lead ores is done—none at Bunker Hill & Sullivan, Idaho; Flat River, Mo.; or Broken Hill, New South Wales. The writer's observations are corroborated in a well-known report on lead and zinc mining and milling. The writers say that the advantages of this practice will depend upon the character of the ore, the quantity of waste material, and other local conditions.

The Hecla mine, Idaho, produces quartzite with galena and silver. Crushed and washed ore is separated into crude shipping ore and waste by six men. Each ore sorter produces 12 tons of ore and each waste sorter 25 tons of waste per shift. The mill has a daily capacity of 900 tons. Sorting is said to save transportation expense by 12 1/2 cents per ton hauled and adds to the plant's capacity.

Formerly 4 percent of the lead, silver, zinc ore of the Morning mine, Idaho, was discarded. The waste assayed under 0.6 percent lead. This sorting plant was for producing a direct smelting ore.

Limestone.—Limestone used for lime and sugar manufacture and for chemi-



Refuse gobbed inside coal mine.

Gold, free and associated with pyrrhotite, pyrite, and arsenopyrite, is so disseminated in a mixed gangue that no sorting is possible at the Homestake mine, South Dakota, but at the Morro Velho, Brazil, where a somewhat similar ore is mined, 4 percent of the 2-in. crusher product is sorted on a picking table.

In the Balatoc mine, Philippine Islands, the vein filling is quartz and/or

13 cents a ton to sort the Reno, British Columbia, ore.

Ten percent of the Sisco ore, Quebec, is discarded. It is a blue to white quartz, with few minerals and visible gold, from veins in grano-diorite. The cost of sorting is 6.7 cents per ton.

As to telluride ore, the writer has seen sortable ore at Kirkland Lake and at Cripple Creek and unsortable ore at Kalgoorlie and at Kirkland Lake. In the



Sorting scrap
steel—
Sparks from
nickel steel.

cal uses must be high grade, and at many places it is loaded by hand so that selection may be made. The hand-loaders sledge the larger fragments to one-man size or smaller, and stone containing impurities is rejected. Several million tons of limestone are used each year as furnace flux, and this also must be low in silica and alumina. At quarries where impure stone is associated with that of high quality, hand loading is commonly followed in order that loaders may reject the impure fragments. Forks are used for loading the smaller spalls so that clay or sand that may accumulate from seams or overburden may be separated. Underburned and overburned rock from lime kilns is sorted out for reburning or for rejection.

Magnesite.—Cobbing and hand sorting of magnesite is followed in some districts, particularly in Austria where schist, dolomite, and quartz are separated. In Washington the ore is hand picked to eliminate inferior ore and to yield a uniform product.

Manganese.—Manganese ores are variable and are not easily sorted, although some of them may be washed to lower their silica and iron contents. The carbonate and silicate ores may be sorted to some extent. The writer examined some small silicate and oxide deposits in quartzite, sandstone, and in chert in California, and suggested that sorting be done.

In general, picking is part of the cleaning of manganese ore. Crushing, washing, and screening precedes picking, which is done on belts. If rock is attached to the mineral, further crushing and sorting follow. The belts may be 18 to 30 in. wide and travel 50 to 60 ft. per minute. The sorter's capacity depends upon the coarseness and fineness of the rock. In Virginia some lump ore is selected for special purposes.

Mercury.—Generally cinnabar occurs as fine to coarse crystals which are easily identified, especially if wetted; but sometimes the mineral appears as a stain which is not so high in mercury as the crystalline type. At most mines some poor or barren rock is thrown out at the crusher. The fines should always be saved.

A limestone ore at a Texas mine is suitable for close sorting. All minus 3-in. rock passes through a gable grizzly to an ore bin and the oversize falls onto a sorting platform at each side. The ore saved is thrown into the bin with the undersize. Half of the run-of-mine ore is discarded at a cost of 8 to 9 cents per ton, and at double this cost for the ore for the retorts.

At a California mine the cinnabar is in altered basalt, much of which is barren, the plus 1-in. ore is sprayed and sorted on a belt, 60 percent being rejected. The mine ore contains 4½ lb. of mercury, the waste 1½ lb., and the retort ore 9 lb. per ton. Screening, sorting, and crushing cost 7 cents per ton of run-of-mine.

At another California property the cinnabar is found in sandstone. Underground, the hanging wall waste is removed and dumped on the surface. In the open pit, 60 percent is sorted out on belts running at either side of a trommel. Screening and sorting of the surface ore costs 15 cents per ton.

The siliceous cinnabar-bearing rock at an Oregon mine, after passing over a 2-in. grizzly, is sorted on a convenient platform. The selected ore is crushed to 1-in. size. About 4 percent of the mine ore is rejected. Two men do all of this work.

Nickel.—At Sudbury, Ontario, the waste is picked off 36-in. belts that travel 35 ft. per minute.

Scrap Metals.—Strictly speaking, "sorting" is not the proper term to use in the handling of scrap metals; "classification" is better. In a scrap yard nothing is discarded; it is a matter of classifying the metals. Men who know scrap realize the importance of its classification, whether it be for sale or for local consumption. Sight sorting is suitable for the common metals, but alloy steels need spark-testing and non-ferrous alloys need special knowledge.

Sillimanite.—An aluminum silicate, occurring in quartz with schist or in schists, is commonly hand sorted or selected before shipment.

Silver.—Silver occurs in a great variety of minable forms, with several minerals in one ore occasionally. At

Cobalt, Ontario, the rich complex silver ore was washed and hand sorted. . . . At the Sunshine mine, Idaho, where the silver is in tetrahedrite, no sorting is done. . . . At Tonopah, Nev., the silver minerals argentite, polybasite, and stephanite are in a highly siliceous rock, of which 6 to 15 percent has been discarded. A little gold is in combination with the silver. . . . At El Tigre, Sonora, rich ore was selected and \$1.90 waste rejected; the mill ore assayed \$20 per ton. This was done on a belt which followed the first crusher. . . . Ten percent of the ore from the Presidio silver mine, Texas, has been rejected as quartz. The silver minerals are argentite and cerargyrite.

Stone.—At quarries that produce building and ornamental stone, sorting is an important process. Blocks are subjected to searching visual inspection and many are rejected because of defects in color or structure.

Tin.—Cassiterite, with other minerals, is generally found in granitic rocks, and if not too disseminated, some sorting is possible.

At Patino, Bolivia, 13 percent of the mine ore—3.3 percent tin—is discarded; the waste assays 0.5 percent and the mill heads 3.76 percent. Dumps with 1 percent tin are improved by sorting to 1.4 percent.

Tungsten.—Ferberite, huebnerite, scheelite, and wolframite are somewhat adaptable to selection or rejection of waste. They occur in silicate rocks, granite, limestone, and pegmatite. The iron tungstate may be easily sorted from its enclosing rock, granite. At the Cold Springs mine, Colorado, a concentrate is produced by sorting and cobbing at a cost of nearly 4 cents a ton. The reject amounted to 15 percent. . . . The manganese tungstate may also be sorted more or less. . . . The calcium tungstate, if in clean gangue may be sorted, but if, as near Mill City, Nev., it is in an intimate mixture of gangue and the scheelite is of similar appearance to the quartz, sorting is impossible. In such a case, close supervision in mining aided by the use of portable ultra-violet lamps underground, prevent inclusion of waste. On the other hand, the grade of some

(Continued on page 19)



FIG. 3.—Fusain as it appears on the surface of a block. This is a common cause of breakage.

Changes in

Constitution of Illinois Coals Through Preparation Processes*

By L. C. McCABE *

MANY of the problems of combustion of Illinois coals are related to the kind and quantity of bands in the coal beds (fig. 1-4) and in the prepared coal. Such significant characteristics as the ash content, the fusion point of the ash, the swelling, coking, free burning tendencies, friability, grindability, and B.t.u. content are intimately related to the kind of bands making up the fuel.

The physical behavior of these bands in mining, screening and shipping is important. If a number of blocks of coal are examined, it becomes apparent that on the majority of them the surface parallel to the bedding plane is covered with fusain (fig. 3). This is rather definite proof that the fusain is structurally the weakest member of the four coal components and is primarily responsible for degradation.

Occasionally blocks will be seen with one or both surfaces parallel to the bedding plane covered by vitrain (fig. 4). Vitrain is more resistant to breakage than fusain, but is much weaker than clarain. It is the secondary cause of breakage in mining and preparation. Clarain, on the other hand, is closely knit together and stands up well under mechanical handling. When durain is present, it is the toughest and most resistant component. It is of little importance quantitatively, as clarain, vitrain, and fusain probably make up over 99 percent of the combustible parts of Illinois coals.

These breakage characteristics have a great deal to do with the kind of coal

that goes into the prepared sizes. Both vitrain and clarain can be found in the lump, and most of the surfaces will have a thin layer of fusain on them where the lumps have split along fusain layers. Most of the fusain has broken off, however, and will be found in the screenings, or if the coal is dedusted it will be found in the dust.

The egg (3 by 2 in.) may have some of the smaller vitrain bands, but for the most part is clarain. The No. 2 nut (2 by 1 1/4 in.) is still richer in clarain. In most coals the No. 3 nut (1 1/4 by 3/4 in.) is 8 to 10 percent higher in vitrain than the coal bed from which it was mined.

Vitrain continues to concentrate below 48-mesh in most instances until the 100- or 200-mesh size is reached. Below this the fusain is ordinarily highly concentrated.

Washing may play a considerable part in separating the ingredients. In the minus 1 1/4-in. screenings from one mine, 58.9 percent of the coal floats at 1.30 sp. gr. The coal floating is 58.2 percent

vitrain, 40.0 percent clarain, 1.1 percent fusain, and 0.7 percent middling refuse. The average vitrain content of the coal bed is only about 20 percent. This vitrain content is so highly concentrated in



FIG. 1.—Block of No. 6 coal composed of fusain (F), vitrain (V), and clarain (C).

* Presented to Fifth Annual Illinois Mineral Industries Conference, Urbana-Champaign, October 8, 1937.

* Associate Geologist, Coal Division, Illinois State Geological Survey.

the fraction floating at 1.30 sp. gr. that there is, as previously indicated, a diminution of vitrain and an increase of clarain in the nut and larger sizes.

The coal division of the State Geological Survey recently made a microscopic analysis of a washed $\frac{3}{8}$ -in. by 48-mesh coal from an Illinois mine which showed the following composition in comparison to the coal in the seam:

	Washed $\frac{3}{8}$ -in. x 48-mesh	Coal bed (percent)	(percent)
Vitrain	40.8	19.0	
Clarain	51.9	69.9	
Fusain	2.6	4.5	
Refuse	4.7	6.6	

The foregoing summary of the effect of sizing and washing and the chemical

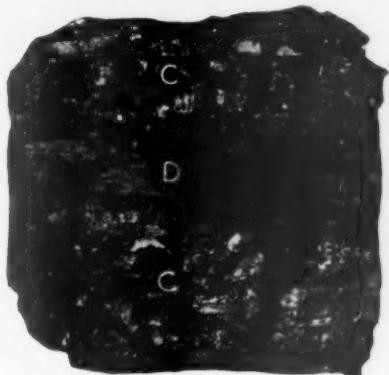


FIG. 2.—Lump of No. 6 coal containing clarain (C), and durain (D).

characteristics and distribution of the banded ingredients give a generalized view of the information collected for the purpose of conducting studies of how these different sizes and, consequently, different mixtures of ingredients burn.

To understand and make use of these differences is the problem which now confronts us. Differences of several hundred degrees in the fusion points of the ash from vitrain and clarain have been reported.

There is a wide difference in ease with which the bands grind. Durain is difficult to grind, clarain is less difficult, vitrain grinds easily, and fusain offers little resistance. These are important considerations where the coal is powdered before firing and the cost of grinding must be considered.

Much of the difficulty of uneven burning in the stoker fuel bed may be attributed to the high-swelling nature of

the vitrain which our studies have shown to be concentrated in the stoker sizes. Crushing egg and large nut sizes, which are high in relatively free burning clarain, and mixing them with the normal stoker sizes or marketing the products as a special stoker fuel, may be desirable for some mines.

These characteristics are strikingly brought out in several hundred feet of colored moving picture film which the survey has made of combustion of the different coal ingredients from the same mine. In the high vitrain fuel marked coke tree development was obtained by "blow holes" in the fuel bed. A very even fuel bed developed in the clarain.

Other fuel problems may arise because of the physical behavior of the bands which make up the coal. Sometimes a regional study of the coal beds may suggest changes in screening or washing procedure which will alter the composition of a particular coal.

|| Sorting

(Continued from page 17)

scheelite ore has been raised from 28 percent to 40 percent WO_3 by hand cobbing. . . . The iron-manganese tungstate deposits are irregular and may be suitable for some sorting.

As the gravity of the tungsten minerals is 6 to 7, an experienced sorter handling the ore should be able to determine by hefting what is ore and what is rock, with a gravity of less than 3.

Zinc.—The zinc minerals are generally so scattered and associated with other minerals that sorting is infrequent. This is the writer's observation which is backed by others, as mentioned under lead.

At the Giesche mine, Poland, the blende and some galena and marcasite occur in dolomite. Crushed and washed 2 to 3-in. and 1 to 2-in. ore is hand sorted on revolving tables. This is said to be fairly easy work and 20 percent of waste carrying 0.9 percent zinc is dumped for future treatment.

Domestic Consumption of Iron and Steel Scrap Registers Large Increase in 1936

American industry consumed 36,358,133 long tons of iron and steel scrap in 1936, an increase of 38 percent over 1935, according to a survey recently completed by the Bureau of Mines, United States Department of the Interior. This large increase was made despite the sharp rise in scrap prices caused partly by the heavy export trade in that commodity during 1936. Higher prices for scrap resulted in some substitution of pig iron in furnace charges (consumption of pig iron increased 46 percent), but the survey indicated no major changes in furnace practice in any section of the country. Consumers in the principal steel-making regions used relatively more pig iron, but those situated in areas remote from pig iron supplies used relatively more scrap. An interesting fact developed by the survey is that the industries of the United States used more scrap iron and steel than pig iron during the year.

Of the total scrap consumed in 1936, 17,456,744 tons was purchased material, i.e., scrap gathered through the ordinary

channels of the waste material trade, whereas 18,901,389 tons was home scrap most of which was obtained as a by-product from current fabricating operations. These tonnages represent increases over 1935 of 34 percent in the use of purchased scrap and 42 percent in the use of home scrap.

Ferrous scrap or pig iron is consumed in all of the 48 states, in the District of Columbia and in Alaska. In 1936 the six largest steel-producing states, Pennsylvania, Ohio, Indiana, Illinois, Michigan and New York consumed 78 percent of the scrap and 83 percent of the pig iron. Pennsylvania was the leading consumer accounting for 24 percent of the scrap and 30 percent of the pig iron. Seventy-two percent of the scrap and 73 percent of the pig iron used in 1936 was charged to open-hearth furnaces.

The conservational aspects of scrap utilization are illustrated by the fact that the quantity of scrap consumed in 1936 was 37 percent greater than the total iron content of domestic and foreign iron and manganeseiferous iron ores used by domestic iron and steel manufacturers; purchased scrap alone amounted to 66 percent of the iron content of the ores used.

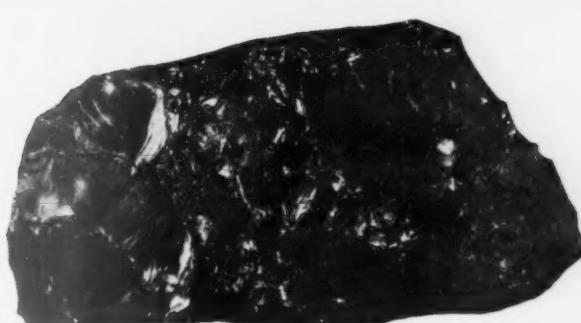


FIG. 4.—Block turned on edge to show break in vitrain.

Mechanization Trends

Reports of Coal Operators Committees

Limits of the Use of Time Studies

AS A result of natural factors and others of man's own doing, the mechanization of mining production methods stands squarely with us. The transition has already begun and the roots extend several years into the past. The growth of the movement is bringing its "growing pains," which were to be expected.

The development of the spinning jenny and weaving machine raised grave problems in the textile industry at the time, but necessary adjustments were made, and few, if any, would willingly relinquish the many comforts of our modern civilization thus made possible. The introduction of cutting machines in the coal industry created a furore, but the adjustment was made and today we find them universally used. The transition to complete mechanization of our coal mines will occasion further adjustments but they also will be made and the future will find us enjoying the many benefits.

The outstanding problem of the operators in the industry today is to make full use of the opportunities that are now available and others that can be had, through adoption of more complete mechanization. The manufacturers of mining equipment have, by expenditure of money and effort, developed devices adaptable to every phase of mechanized coal production. To be sure, their developments will bear further progress, and their resourcefulness in the past is ample testimony of their capability in meeting the problems of the future.

As mechanization advances the arrangement of the component parts of our mining cycles becomes more complex and the need for close coordination arises. A single miner working a small "country bank" has no such worries. Scheduled operation means nothing to him but it is the very life of a large mine with hundreds of men. For that reason we have witnessed the gradually increasing use of analyses of production methods; motion studies or what are commonly referred to as time studies.

Production analyses or time studies have for their objective the more efficient utilization of machines and the efforts of

man, in accomplishing certain results. The function of both machines and men is definitely limited but much can be done to combine their functions in such a manner as will produce maximum results. The evaluation of the many factors that affect any mining operation is an absolute necessity. The nature of the roof and bottom, physical characteristics of the coal, impurities in the seam, the height of the seam, the width of working places, methods of cutting, sequence of operations and many other things have a direct bearing on results obtainable. Some are fixed while others can be changed, but the correct combination can only be determined by careful analysis. Such analyses can be made in most cases by time studies.

The actual job of making a time study seems extremely simple but we must not be fooled into believing that this is always the case. Fundamentally, an observer, a time indicator and a form for recording data are all that is required. The method of tabulating data is of great importance. It should be readily adaptable to the recording of the many minute details of the operating cycle that affect performance, so that the observer's attention can remain focused on his study. The observer must be alert and well acquainted with the nature of the work performed in order to make a satisfactory analysis of the operation. After all, the completed time study is the observer's picture of the performance, and its value depends entirely on his ability.

A well organized system of making time studies of a particular machine or unit of operation will produce results. A sufficient number of consecutive studies will give the data from which the representative performance of the unit can be established. It must be emphasized, however, that it is very easy to arrive at conclusions that are incorrect and misleading. This is especially true if an attempt is made to estimate the performance of an entire operation from time studies of the producing units only. It must be remembered that the limits of the time studies define the limits of the deductions that can be drawn, and even then the accuracy of the performance indicated is subject to many factors.

This is not to be construed as an argument against such studies but rather as one for urging the necessity of a proper and intelligent interpretation of their results.

The total cost of coal production is the complex result of many variables. At active mining operations this result or total cost is known and an attempt is made to break down and allocate that total between as many items as possible. The unit costs thus calculated for these items depend entirely on the system of allocation. Due to this characteristic of mining costs, it becomes a most involved matter to make satisfactory comparisons between different operations, different mining methods and various practices. It therefore becomes evident that an attempt to use a time study of any producing unit as an indicator of total production cost will give misleading figures.

Conveyor Time Studies

In making a survey of conveyor mining methods and practices in the various coal fields, the National Project Committee on Conveyor Mining found that a need existed for a standard time study form so that reports submitted from different operations would be comparable. Such a form was prepared and has been used for some time in making their studies. The reports on the opposite page, and others that have appeared in recent issues of *THE JOURNAL*, illustrate the use of these forms in making time studies of conveyor units. By presenting such standard reports, which indicate clearly the conditions at each operation and the performance realized, operators can compare their work with that of others and learn many valuable lessons. Those contemplating conveyor installations can be guided by the experience of others, and thus avoid at least some of the many pitfalls that can be encountered.

This method of time study presentation is now being widely accepted because many operators have found it valuable in making studies for their own purposes and keeping a check on their performance. A supply of these forms can be secured from the American Mining Congress, Washington, D. C.

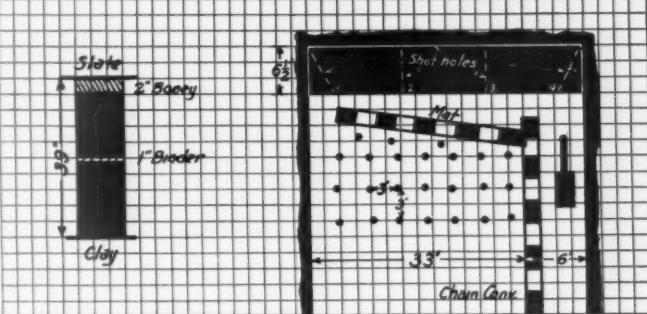
CONVEYOR TIME STUDIES

Room Mining.

Submitted, November, 1937
Committee of Western Pennsylvania

SUMMARY OF TIME STUDY			GENERAL NOTES ON OPERATION		
KEY TO CHART	MAN MINUTES	PERCENT	TONS PRODUCED DURING TIME STUDY <u>53 Tons - 31 hrs</u>		
C CUTTING	13.5	8.0	TYPE CUTTING MACHINE	<u>Shortwall</u>	
K CLEANING KERF	68	4.0	DEPTH CUT	<u>6"</u>	CARDED OR LOADED
D DRILLING	102	6.1	TYPE DRILL	<u>Electric hand</u>	
F TAMPING-FIRING	115	6.8	NO HOLES	4	TYPE EXPLOSIVE <u>Pellet</u>
T TIMBERING	86	5.1	NO. TIMBERS	10-12	
B BRUSHING-TOP, BOTTOM	60	3.6	THICKNESS	<u>Carded or loaded</u>	
P PICKING IMPURITIES			THICKNESS OF IMPURITIES	<u>3"</u>	
L LOADING AT FACE	400	23.9	NUMBER OF CLEAN-UPS	2+	
H CAR TRIMMING	267	15.9	TYPE HOIST	<u>Electric</u>	
S HANDLING SUPPLIES			TYPE CONVEYOR	<u>Chain</u>	
E EXTENDING CONVEYORS	83	4.9	CAR CAPACITY	<u>1-5</u>	
R REPAIRS	10	.6	GENERAL REMARKS		
M MISCELLANEOUS	175	10.4			
I IDLE	179	10.7			
TOTAL	1680	100.0			

SKETCH SHOWING SEAM SECTION AND LAYOUT OF OPERATION

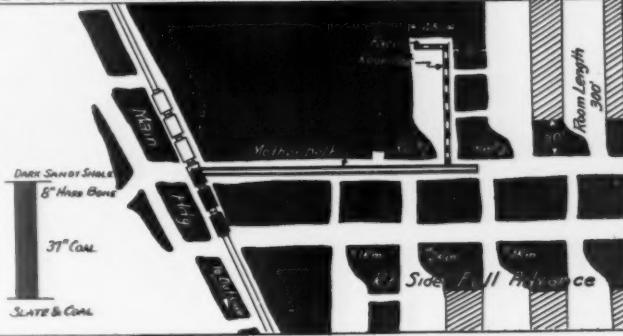


Room Mining and Pillar Recovery.

Submitted
District Committee of Central Pennsylvania

SUMMARY OF TIME STUDY			GENERAL NOTES ON OPERATION		
KEY TO CHART	MINUTES	PERCENT	TONS PRODUCED DURING TIME STUDY		
C CUTTING	54	3.6%	TYPE CUTTING MACHINE	Dot cutter-	60
K CLEANING KERF	32	2.1 "	DEPTH CUT	5 1/2 ft	loaded
D DRILLING	63	4.2 "	TYPE DRILL	Electric	
F TAMPING-FIRING	66	4.4 "	NO HOLES	16	TYPE EXPLOSIVE Permi.
T TIMBERING	42	2.8 "	NO. TIMBERS		
B BRUSHING-TOP, BOTTOM	16	1.1 "	THICKNESS	8" Bone	GOBBED OR COMBED
P PICKING IMPURITIES	294	19.6 "	THICKNESS OF IMPURITIES	8" Top Bone	
L LOADING AT FACE	390	26.0 "	NUMBER OF CLEAN-UPS	2 (45° face room)	
H CAR TRIMMING	—	—	TYPE HOIST	Electric	
S HANDLING SUPPLIES	103	6.9 "	TYPE CONVEYOR	chain	CAR CAPACITY 1000 10 CM
E EXTENDING CONVEYORS	131	8.8 "	GENERAL REMARKS		
R REPAIRS	—	—	Trimmers time not counted		
M MISCELLANEOUS	25	1.7 "			
I IDLE	282	18.8 "			
	1498	100.00			

SKETCH SHOWING SEAM SECTION AND LAYOUT OF OPERATION





New power plant of Pend Oreille Mines and Metals Co., at Metaline Falls, Wash.

POWER at METALINE FALLS

By LEWIS P. LARSEN *

THE Pend Oreille Mines and Metals Company, of Metaline Falls, Wash., is now producing power from its newly constructed power plant in sufficient quantity to operate its mine and mill, as well as to supply electrical power to other industries in this district.

This power project was begun on December 20, 1936, and the plant was producing 2,100 hp. in electrical energy on September 10, 1937. Water is supplied the turbines through a 20-ft. by 12-ft. diversion tunnel 700 ft. long, which has its inlet above Metaline Falls, on the Pend Oreille River. The power plant is located below these falls, and on the same side of the river as the inlet to the tunnel. A surge basin, connected by a raise from the tunnel, is located 60 ft. upstream from the power plant.

The power plant is constructed of reinforced concrete throughout. Sixty-seven hundred cubic yards of solid rock were removed to give footing for the power plant proper, and fourteen hundred cubic yards of rock were excavated to provide an entrance way to the plant. All machinery was brought into the building through this entrance, which is a 45° incline, 90 ft. long, lined with reinforced concrete, and equipped with

steel rails for a car used to transport materials. From the footings up, the power plant consists of the following divisions: Foundations anchored to the solid rock; tailrace with two tailgates to each turbine; turbine floor, which is at the tunnel level, and on which are located the vertical runner turbines; generator floor, on which are located the generator proper, and all of the governing equipment; balcony floor, on which is located the switchboards and controls for the electrical power. Above the power house, on the cliff which overlooks the river, is located the transformer station, from which power lines extend to the various places where the power is utilized.

Eighty-five hundred cubic yards of rock were removed to drive the tunnel, which is 650 ft. long, and carries at uniform grade from the power house to the headgates. Seventeen hundred cubic yards of rock were excavated to provide foundations at the headgates. The surge basin called for 6,000 cu. yd. of excavation, making a total of 25,000 cu. yd. of rock excavation for the entire project. Rock was removed by mechanical loading

into cars, and later by a system of conveyor belts.

The power plant operates under a variable head ranging from a maximum of 26 ft. during the low-water stage to a minimum of 17 ft. during the high-water stage of the Pend Oreille River. Turbine runner blades are manually adjustable to compensate for this variation in head. The power plant is partially submerged during periods of high water, and the tailrace gates are under water at all times.

Concrete pours amounted to a total of 5,000 cu. yd. The power house and entrance raise required 4,500 cu. yd., while the inlet works required 400 cu. yd. Miscellaneous concrete amounted to 100 cu. yd., poured in cofferdams at the inlet and the power-house locations.

Difficulties encountered in construction of the project were brought about chiefly by cold weather and rising water at the spring breakup. The total time required for the project was 265 days.

View inside diversion tunnel.



* President, Pend Oreille Mines & Metals Co.

Of All Things . . .

Pity the Federal Trade Commission. . . . In one day recently it ordered one company to stop advertising that its product will permanently remove hair and another company to stop alleging that its product would grow hair permanently. . . . Maybe the Commission chemists got mixed up on the two products? . . .



The Duke of Windsor is smart. . . . He's going to study the unemployment situation and there is no steadier job than that. . . .



A champion steer sold for \$1.60 a pound the other day. . . . It makes one shudder to think what he will bring in the butcher shop. . . .



"Republicans to Oppose President," declares a headline. . . . Well, things haven't changed a bit in five years. . . .



Mrs. Roosevelt, in her daily column, declares we owe it to the world to preserve our sense of humor. . . . She's right, of course, but the taxpayer finds it mighty hard to do at times. . . .



Former Candidate Landon asserts that many Americans are dissatisfied with the New Deal program. . . . Well, well, somebody has been reading the 1936 election returns. . . .



What the Government needs is that chap on the flying trapeze to take hold of the budget situation. . . . Remember how he balanced himself with the greatest of ease? . . .



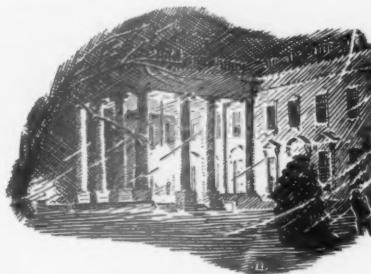
Revised definition of an economic royalist: . . . A person who is no longer dependent on the Government for a living. . . .



Seems like we didn't have much trouble staying out of foreign entanglements until Congress passed the neutrality law telling us how to do it. . . .



Chairman Hosford of the Bituminous Coal Commission must have heard of In-Again-Out-Again Finnegan, a character in the western mining country, who quit the "holes" one day and was back the next rustling for a job. . . . First Hosford resigned . . . then he announced the resignation would be held in abeyance while he stayed on for a couple of months . . . then he conferred with James Roosevelt and announced that he was withdrawing his resignation. . . . Young Roosevelt must be almost as persuasive as his father. . . .



The chaplain of the Senate opened the special session with a prayer for the people. . . . The people need it. . . .



Charley Michelson, ace publicity man for the Administration, comes from the "hot water country" of Nevada. . . . Nowadays the Government can use a man who knows something about getting out of hot water. . . .



In Washington a chauffeur shot himself rather than take his master's dog for a ride. . . . At last, we know what is the matter in Washington! . . .



Twelve Washington fire engines roared up to the Capitol when an alarm was turned in a few days before the session opened. . . . A waste-paper basket in a marble hallway off the rotunda was on fire. . . . Damage—10 cents. . . .



Senator Borah has his moments. . . . Commenting on the story from England where a mentally unbalanced man interrupted solemn Armistice day service by shouting at the King: . . . "Stop all this hypocrisy! You are deliberately preparing for war," the Idaho Senator remarked. . . . "That man may be crazy, but he certainly has his lucid intervals."



George M. Cohan has a lot of fun taking off the President in the new musical comedy hit, but he'd be twice as funny if he'd imitate some other national figures F. D. R. sees in action. . . .



The White House is always besieged with crazy requests. . . . One of the best was the other day of a chap from Philadelphia who wanted to see the President about changing the design of a new postoffice building up there. . . . It seems the architect had not provided for those ridges found on the older buildings and now the pigeons would have no place to roost. . . . They turned him over to the pigeon relief division of W.P.A. . . .



One Government agency that figures there are some things Americans can know that foreigners shouldn't is the State Department. . . . The other day one of its infrequent press conferences for "American correspondents only" was held and the boys heard the inside story about Brazil. . . . Outside, waiting to get the story secondhand, were representatives of all the big foreign news agencies. . . . The strange thing about it is that very few stories went out over the cables. . . .

FEDERAL FINANCE and TAXATION[†]

V. Suggested Amendments to the Revenue Laws

IN EACH of the last six years, following the announcement of substantial deficits, there has been a new tax measure of major importance. It is obvious that we cannot hope for any substantial reduction in the present heavy tax burden or any thorough and equitable revision of our taxing system until the budget problem has been solved. There is only one solution, supported both by common sense and necessity—the reduction of expenditures to a level which can be met by fair and honest taxation.

A general revision of the tax laws has been announced for the next session of Congress. The principal measures which will be under consideration will be (1) the undistributed profits tax, (2) the taxation of capital gains and losses, and (3) the capital stock and excess-profits taxes.

I earnestly recommend the following:

(1) The substitution of a reasonable tax upon capital gains. (My recommendations on this subject are set forth in an article appearing in the TAX MAGAZINE for June, 1937, under the heading, "Current Trends in Federal Finance and Taxation.")

(2) The repeal of the present capital stock and excess-profits taxes.

(3) If the capital stock and excess-profits tax system is not repealed, then most certainly a new declaration of value must be granted.

(4) The immediate repeal of the thoroughly discredited undistributed-profits tax.

(5) If the undistributed-profits tax is retained, it should be amended (with the amendments given retroactive effect) to remedy the following proved defects:

(a) The illogical base upon which the tax is imposed, defined as "undistributed net income";

(b) The inadequate relief provisions for corporations in unsound financial condition;

(c) The failure to exempt from the tax corporations with impaired capital;

(d) The attempt to measure profits by the arbitrary period of one year—that is, the absence of any provision for a reasonable "carry-over" period for losses;

[†] Second and concluding installment of paper presented to Metal Mining Convention, Western Division, The American Mining Congress, Salt Lake City, Utah, September 10, 1937.

* Counsel, The American Mining Congress, Washington, D. C.

By ELLSWORTH C. ALVORD *

(e) The failure to recognize that earnings may not be in a form available for distribution;

(f) The unnecessary requirement that dividends be declared and paid before the end of the taxable year;

(g) The absence of any protection against unforeseeable taxation resulting from redetermination of net income by the Government after the close of the taxable year;

(h) The absence of any provision for appropriate expenditures for expansion or replacement of productive facilities, including the exploration and development of mines;

(i) The failure to permit the accumulation of reasonable working capital; and

(j) The failure to permit necessary reserves to be set aside for business contingencies.

These defects will now be described in greater detail.

(a) Illogical Base of the Tax

Perhaps the most serious objection to the tax as now drafted is the fact that it is designed to reach the "undistributed profits" of the corporation but is measured by the "undistributed net income" of the corporation—an entirely different concept. "Undistributed net income" is a concept created by statute. It is arbitrarily defined in the statute in terms which favor the Government, both as to inclusions and exclusions. "Undistributed profits," on the other hand, is a business concept. It is computed in accordance with accepted business and accounting practices and determines the extent to which dividends can be paid. There is no definition of this term in the statute.

Thus, it frequently happens that a corporation is liable for an undistributed profits tax, based on the existence of a certain amount of "undistributed net income" as defined by the statute, whereas, in fact, there are no "undistributed profits" out of which dividends can be paid. This point can be illustrated by an actual case which has recently come to my attention.

A corporation owning an iron mine leased it several years ago for a royalty of 35 cents per ton. At that time the company elected to take depletion on a percentage basis which, at the statutory rate of 15 percent, amounted to 5.2 cents per ton. However, actual depletion sustained, according to the 1913 basis, amounted to 20 cents per ton. For purposes of "undistributed net income," depletion is deducted at the percentage rate of 5.2 cents per ton; while, for purposes of "undistributed profits," depletion is deducted at the actual rate sustained of 20 cents per ton. In 1936 the company received royalties of \$350,000 on the 1,000,000 tons mined that year. Its taxable net income amounted, therefore, to \$298,000—i. e., \$350,000 gross income minus \$52,000 percentage depletion. Its profits available for dividend distribution, however, amounted to \$150,000—i. e., \$350,000 gross income minus \$200,000 actual depletion sustained. Thus, even if the company attempted to comply with the undistributed profits tax by distributing its taxable income of \$298,000, the Government would regard only \$150,000 as a "taxable dividend paid," and would assert an undistributed profits tax on the remainder.

This company is forced to pay a penalty tax on a fictitious profit. Exactly the same situation arises when deductions from net income are limited on other items such as capital losses, net losses, Federal taxes, and reserves for contingencies, while the full amount of these items reduces earnings and profits. A similar absurd result is produced when a certain amount of income is recognized for "net income" purposes from such items as appreciation in inventories, installment sales, improvements by lessees or cancellation of indebtedness, while these items are not recognized to the same extent in computing earnings and profits.

Thus, many corporations are being compelled to pay more than their actual profits to the Federal Government by reason of a fictitious calculation of "un-

distributed net income" wholly at variance with their true income. Such a disparity between the base of the tax and the object sought to be taxed will put many taxpayers out of business unless it is promptly corrected.

(b) Debt-Ridden Corporations

The Act in its present form fails to provide a decent measure of relief for corporations unable to distribute profits freely because of their existing debt structure. This defect is inexcusable, and has drawn the fire of almost every commentator on the undistributed profits tax.

Some idea of the magnitude of this problem may be judged by the fact that at the end of 1934, the latest year for which figures are available, the total debt of corporations amounted to \$76,000,000,000, composed of \$27,000,000,000 of floating debt and \$49,000,000,000 of bonded debt and mortgages. These figures indicate a debt service of three to four billions annually—profits which cannot be distributed to the stockholders.

From the time the first bill to impose an undistributed profits tax was introduced, it has been agreed that relief from the tax should be granted for amounts used in repayment of indebtedness. The "relief" provisions finally enacted, however, are so limited in scope, so hedged about with technical requirements, and construed with such exaggerated strictness by the Treasury Department that they are positively farcical. Finding a contract or debt that qualifies for relief under the statute is like Diogenes's search for an honest man.

Consider, for example, the case of a long-established manufacturing concern in New England, which suffered severe losses during the depression and in 1935 secured a long-term loan from the Federal Reserve Bank for the purpose of refunding outstanding commercial loans. The loan agreement provides that the bank may declare the whole indebtedness immediately due and payable upon the declaration of dividends which, in the judgment of the bank, are unjustified or adversely affect its interest. This contract does not qualify for relief under the statute, as construed by the Bureau. If this company, in accordance with sound financial procedure, applies its earnings to repay the loan, it will be subject to the undistributed profits tax. But, if the unfortunate company uses earnings to pay dividends in order to escape the tax, the Reserve Bank will probably require payment of the entire outstanding indebtedness.

Another typical instance is that of a corporation which was denied relief under the statute because its contract required the liquidation of that portion of its outstanding debt equivalent to a stated percentage of the earnings of the preceding calendar year. This type of provision is commonly used in order to give the debtor time for an accurate determination of the amount of earnings available for debt retirement. The statute, however, affords relief only to con-

tracts relating to the earnings and profits of the current year.

Other common provisions which are now outside the scope of the relief sections are requirements that a certain amount of a preferred stock issue be retired annually, or that the corporation maintain a fixed ratio of quick assets to current liabilities by accumulating earnings and profits, or that no dividend be paid until all accruing interest and a reasonable amount of outstanding debt have been paid. Despite the fact that these are all legitimate and necessary business arrangements, the Government is still demanding its "pound of flesh" in the form of an undistributed-profits tax.

The fact is, that it is a wholly fortuitous circumstance for any debt contract now in existence to meet the artificial standards of the statutory relief provisions. And, I remind you that even in the rare case where the contract does qualify under the statute, the refunding or renewal of the contract in identical terms *after May 1, 1936*, will deprive the corporation of the relief to which it is entitled. In this connection, let me call your attention to one of the most amazing cases I have yet encountered. A debtor corporation was about to enter into an extension agreement with its creditor. The Bureau solemnly advised it that such an extension agreement might be construed as a new contract which would be ineligible for relief, but that if the company were to default on its present contract, it would still be entitled to the benefits of the section. The Government is thus construing a statutory provision in such a way as to encourage defaults by debtors of existing contracts in order to preserve tax benefits and stifling the negotiations of honorable extension agreements between debtor and creditor.

An immediate and extensive liberalization of the "relief" provisions is a paramount necessity.

(c) Impaired Capital Corporations

Relief is granted under the Act to corporations which are either (1) in bankruptcy under the laws of the United States or (2) both insolvent and in receivership. However, corporations with impaired capital which have managed to stay out of bankruptcy or receivership are granted no relief from the tax, although they are in the same predicament, being forbidden by the laws of most states to declare dividends.

If such a corporation obeys the state law under which it is chartered by refraining from distributions to stockholders, the resulting penalty tax will probably complete the collapse of the corporation. If, on the other hand, dividends are distributed in order to avoid the tax, corporate directors invite per-

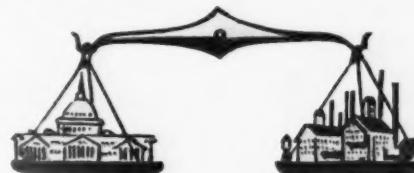
sonal liability, and even, in some instances, criminal penalties.

Defenders of the tax argue, however, that an impaired capital corporation can avoid this dilemma. It is suggested that the corporation reduce its capital structure to the extent necessary to wipe out the impairment. Then, the company will be in a position to distribute current earnings.

The fallacy of this easy solution is illustrated by the case of a corporation organized at the outset of the depression with a paid-in capital of \$15,000. In the first year it lost \$7,000; in the second year, another \$9,000—thus wiping out its original capital and leaving an additional deficit of \$1,000. In 1936 business picked up and the company made a profit of \$7,000. In order to reduce the corporation's capital structure sufficiently so that this \$7,000 of earnings can be distributed, the company must write off *all* its stated capital!

The impracticability of this suggestion for writing down capital is also indicated by the amount of time required to effect it. Usually there is no time to carry out such a plan when the need for it becomes vital. It takes three or four months to prepare a satisfactory plan of readjustment, to hold the necessary stockholders' meetings, to secure the consent of stockholders, bondholders, and creditors, and to comply with the necessary state laws for amendment of charter, registration, publication, etc. Unfortunately, a company is rarely in a position to estimate its earnings accurately three or four months before the close of the year and thus to determine the amount to be written off.

This was the recent experience of a nationally known manufacturing concern. It emerged from the depression with its capital impaired. The company has three classes of stock outstanding—first preferred, with accumulated unpaid dividends of \$35 per share; second preferred, with unpaid accumulations of \$40 per share; and common stock. The character of its business is highly seasonal, with greatest concentration in the last months of the year. If this company attempts to secure stockholders' consent for a reduction of capital, it will have to allow at least four months prior to the close of the year for this purpose. But at that time the company's estimated earnings would be a mere guess. Obviously, the corporation cannot hope to ask each class of



stockholders with their conflicting interests to make capital sacrifices, when its estimate of earnings is so indefinite. On the other hand, if the company fails to reduce its capital structure, and earnings eventually prove substantial, the directors will be subject to criticism for failure to take the necessary steps to avoid the surtax.

Finally, it is a well-known fact that most write-downs are blocked by stock-

holders and creditors in a preferred position, who will rarely consent to capital readjustments which adversely affect their interests—especially when the company's earnings are increasing. Yet, increasing earnings is the very factor which makes such readjustment necessary in order to avoid the tax.

It appears, therefore, that corporations with impaired capital are gravely in need of some affirmative relief under the statute—something more substantial than an academic theory. Since such corporations are practically in the same financial straits as corporations in receivership and bankruptcy, I can see no reason for withholding from them the same relief afforded the latter group.

(d) Business Losses

The present law takes no account of the fact that a loss sustained in one business year affects the ability to distribute profits in a succeeding year. Under the statute, each year is treated as an airtight compartment. If there are profits in one year, they must all be distributed, under penalty of an undistributed-profits tax. The fact that losses were incurred in the previous year, or that losses are certain in the next, is ignored.

It seems only common sense that the absence of any provision for carrying forward business losses to succeeding taxable years as a credit against the undistributed-profits tax will result in the progressive depletion of the capital of most business enterprises. I have in mind a prominent woolen textile company, which made \$6,000,000 in profits in 1933 and then lost \$6,000,000 in 1934. If the profits of 1933 had been distributed to stockholders, the loss of 1934 would have been borne out of capital. And present profits cannot be used to restore the 1934 loss, without a heavy-penalty tax.

This is not an uncommon situation. There are many businesses where earnings fluctuate widely from year to year, particularly those industries which carry largely inventories of raw materials subject to rapid price fluctuation.

Moreover, every business concern has to face the problem of the cycle of profitable and lean years. Take the case of a certain small corporation—typical of hundreds in like circumstances. This company, in the 10-year period ending in 1935, had some years of profitable operation as well as some that were unprofitable. If the present law had been applied to its earnings for the decade ending with 1935, the Federal tax would have been 2.5 times the total profit. It must be obvious that the company could not have survived such a drain upon its resources, and, since surpluses could not be built up under such a law, it would have gone out of business.

This, I fear, is what lies in store for every small and new company in the next decade unless the law is adequately amended to permit the offset of business losses of one year against the gains of subsequent years.

(e) Undistributable Earnings

Another serious difficulty encountered arises from the fact that current earnings frequently are not in a form of cash and available for distribution. They are tied up in the business in inventories, equipment, receivables, etc., or may result from "paper profits" computed on the company's books.

Let me illustrate this briefly:

One corporation has profits represented by accounts receivable, which cannot be reduced to cash.

Another, an industrial concern, has profits reflected in inventories of raw materials which have increased from \$75,000 at the beginning of the year to \$117,000 at the close. An unpredictable event, the drought, curtails the company's sales. The undistributed-profits tax will thus attach to the book profits represented by such appreciation in inventories, although there is no equivalent amount of profit available for distribution.

Still a third company keeps its books, and files its return, on the accrual basis—as is typical of most corporate businesses. Although the undistributed-profits tax will be measured by income determined on the accrual basis, relief from the tax can only be obtained by the *actual* payment of dividends.

Installment dealers receiving more than a stated percentage of the sales price must report the full amount of the profit for tax purposes. How can such a corporation be expected to distribute earnings which have not as yet been received?

Earnings may also be tied up in machinery or equipment or in innumerable other items of such a nature as to preclude distribution.

To make the necessary distributions under such circumstances, a corporation is compelled, if it can, to borrow from the banks. This adds to the cost of doing business. It adversely affects the company's credit standing. It disrupts the ratio of quick assets to quick liabilities. And, in the final analysis, it merely postpones the day of incurring the penalty upon the maturity and repayment of the indebtedness.

(f) Payment of Dividends Within Taxable Year

Prior to the Revenue Act of 1936, the tax law has always provided a period of grace of two and one-half months after the close of the year to determine taxable income. This is predicated on the realization that taxpayers must have some time after the end of the taxable period to take account of their year's income.

Under a provision of the new law, however, for purposes of the undistributed profits tax, taxable dividends must be declared and paid before the end of the taxable year. In order to do so, there must be estimated not only taxable income, computed according to statutory rules, but also the several earnings and profits funds for which there are no well-defined rules of determination. The situation is particularly unfortunate because the undistributed profits tax pre-

sents to corporate taxpayers new and complicated tax problems, none of which have yet been adjudicated.

Here is an instance of the injustice of this requirement which must strike home to many of you: In order to make the requisite distribution in time to reach stockholders, a mining company was compelled, about the middle of November, 1936, to estimate its profits as of December 31. At that time it had only nine months' operations accounted for and the price of lead—which was its basic product—was selling at about five cents. Based on these figures, estimates of income were made and the estimated profits were paid out to stockholders. Just before the end of the taxable year, the price of lead advanced rapidly, increasing inventory values and substantially adding to the company's earnings for the year. It was then too late to make additional distributions because of the necessity for directors' meetings, the lack of ready cash, etc. Accordingly, the company was compelled to pay an undistributed profits tax by reason of circumstances it could not have foreseen.

The necessity of making a guess at annual income before the end of the year also inflicts great hardship on businesses which extend long-term credit to customers, those in which revenues are seasonal or fluctuating, and those operating in chains, where computations of income for each unit must be made.

There is no important disadvantage to the government in extending a period of grace for calculating profits. Corporate taxpayers should be allowed full credit for dividends paid up to the time of filing the return.

(g) Redetermination of Income

No relief is now accorded in the event the taxpayer's net income, as shown on the return, is subsequently redetermined and increased by the Commissioner or by the Courts after the close of the taxable year.

A problem of this kind has already risen in the very first year of the tax's operation. In this case a corporation was engaged in a business, the income from which depended on a March 1, 1913, valuation. The corporation had been using a basis approved by the Treasury in 1926, but subsequently objected to by the Commissioner in 1930. The controversy resulted in litigation before the Board of Tax Appeals which determined a valuation differing both from the taxpayer's and the Commissioner's. Both sides are appealing to the higher courts. Thus, this valuation, which is a basic factor in computing the company's income, has not yet been finally determined. Nevertheless, the company was compelled to make dividend distributions in 1936 based on a net income which it could not compute with any degree of accuracy while the matter was still in litigation. If such litigation ultimately results in a valuation higher than the taxpayer anticipated, an undistributed profits tax for 1936 will result even though the taxpayer

attempted to make a full distribution of its 1936 profits.

It is obviously grossly unfair to penalize this company or other companies which have basic items in the determination of net income in the process of litigation, with a retroactive undistributed profits tax. If the profits revealed by such redeterminations are promptly distributed, there should be no additional tax.

(h) Expansion and Replacement

There is no existing credit against the undistributed profits tax for funds devoted to the expansion and replacement of present productive facilities, or for the development of ore bodies.

It is noteworthy that among those who have recognized the need for immediate modification of the law in this respect are the Honorable Jesse H. Jones, Chairman of the Reconstruction Finance Corporation, the Honorable Joseph E. Kennedy, Chairman of the Maritime Commission and former Chairman of the Securities and Exchange Commission, the members of the Interstate Commerce Commission, Senator Pat Harrison of Mississippi, and the late Senator Joseph P. Robinson.

There are several reasons why it is imperative to allow at least a limited portion of corporate profits to be used for expansion and replacement:

First, the inability to use funds for expansion tends to "freeze" the present relative position of small and large corporations. Traditionally, our corporations have started with a small capital and have lived and grown only by plowing back earnings into their business. I need not remind you gentlemen of the financial history of substantially every mining property. Small concerns and recently-organized companies seldom have access to the capital markets. Your early development costs must be paid for out of earnings or not at all.

Second, the effect of the tax in discouraging expansion hinders the absorption of our unemployed in industry. This fact was recently recognized in a report prepared by the National Resources Committee, on "Technological Trends and National Policy," as follows:

*** we must look to a much more rapid expansion of production than has taken place between 1933 and 1935 before we can expect a return either to the employment or to the unemployment levels of the pre-depression period. A rough calculation indicates that, in order for unemployment to drop to the 1929 level by 1937, goods and services produced would have to reach a point 20 percent higher than that in 1929,

even if the productivity level of 1935 remained unchanged."

Third, by putting a "brake" on expansion of productive facilities, the tax has accentuated current inflationary tendencies. The recent sharp rise in wages and prices has stimulated an upward spiral towards new inflationary price levels. Marriner S. Eccles, Chairman of the Board of Governors of the Federal Reserve System, recently pointed out that:

"The way to control [such] unjustifiable price advances is by increasing production. This can be done so long as there is idle labor willing to work, so long as there are unused natural resources and an abundance of money at reasonable rates. All three of these conditions are present at this time."

If the undistributed profits tax continues to curb expansion, however, this method of control will not be available to industry. The tax cost now makes construction projects economically impracticable.

(i) Working Capital

One of the most common objections to the present law is its failure to permit the accumulation of necessary working capital out of current earnings.

In times of depression, business usually reduces inventories either because of financial pressures or decreased business volume, resulting in a decrease in the amount of working capital required. In times of increasing business activity, however, the trend is reversed—larger inventories and constantly rising prices

tend to require an increase in working capital. Such working capital should be built up out of the current profits of the business.

The undistributed profits tax, however, makes it impossible for a corporation to build up the necessary working capital out of earnings except at a prohibitive tax cost. For instance, if a corporation with \$100,000 net income finds it necessary to retain 50 percent of the earnings for working capital, it will have to pay the Federal Government a total of 24.66 percent of its income in taxes—or for every dollar retained it will pay another 49.32 cents to the Government.

It is doubtful whether a dollar retained can earn enough additional to cover this cost. Accordingly, corporations cannot justify the retention of earnings under such circumstances, and must readjust their business operations to conform to reduced working capital.

This situation is especially acute in industries where the cost of raw materials constitutes a large percentage of the price of the finished product and where the price for such raw materials is constantly rising. Thus, a large mail-order house in 1936 found that prices for its inventory were rising so fast that it needed its entire income from sales—profits as well as return of cost—to replenish its stock. The undistributed profits tax, however, compelled it to distribute these profits to the stockholders. It therefore had to go into the market and borrow money to keep up its inventory. This process cannot be repeated often without injury to the business.

A similar situation prevails in the textile, steel, capital goods, leather, and flour milling industries.

Unless some provision is made for the retention of needed working capital, whole industries must either curtail their activities substantially or else conduct them with expensive borrowed capital, thus increasing the ultimate cost to the consumer.

(j) Reserves for Business Contingencies

The undistributed profits tax penalizes the accumulation of reserves for business contingencies—even though many of us recall the important role such reserves played during the recent business depression.

For the five years, 1930-1934, corporations reported in their income tax returns aggregate statutory losses exceeding \$29,000,000,000. Because of surpluses accumulated in more prosperous years, the majority of those corporations were able to continue in business, to retain employees on their payrolls, and to maintain their dividend payments. In this way they aided the economic welfare of the country

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Preparing for Another Crash.



MINERAL LAND WITHDRAWALS[†]

By ERSKINE R. MYER *

CERTAINLY it is with some degree of temerity that any lawyer would accept and fulfill an invitation to speak on a controversial subject before a meeting of the American Mining Congress, because our profession has so frequently been charged by mining men, as well as others, with justifying the thought expressed in the lines of the poet, Gay:

"I know you lawyers can with ease
Twist your words and meaning as
you please;
That language by your skill made
pliant
Will bend to favor every client.
That 'tis the fee directs the sense,
To make out either side's pretense."

Perhaps it was such a thought that prompted a mining district in the early days to provide the penalty of death for murder or horse stealing, and flogging and banishment for all lawyers and Chinamen. I hope that to some extent, at least, we have redeemed ourselves and

that the legal profession may continue to aid the mining industry in its efforts to solve the difficult problems which constantly arise because of the vast number of laws and regulations, the increasingly serious burden of taxation and the complexities of modern corporate and industrial enterprise.

Origin of Mining Code

The mining industry, and particularly that branch of the industry involving metals, has from the days of its earliest development in this country been notable, among other things, for its independence. Because of that independence and because of the force of character of the men who founded the mining camps of the West, this industry has the distinction of contributing to American jurisprudence a unique system of rules having the force and dignity of law and later enacted into law, for the government of mining affairs. The simplicity and effectiveness of these rules might well be considered today as an example to those who frame the policy of our Government and enact our national statutes. Costigan, in his work on min-

ing law, goes so far as to state that the miners' meetings at which these rules were adopted played a part in the education and civilization of the mining frontier comparable only to the influence of the New England town meeting on New England institutions.

The late Charles J. Hughes, former United States Senator from Colorado, and a distinguished lawyer of great ability, in an address before the American Bar Association, in 1901, traced the origin of these remarkable enactments and the principles common to all of them in these words:

"The mixed character of the inhabitants of this new territory, gathered from all quarters of the globe, bringing with them ideas of law and right with reference to mining peculiar to their own sections, with freedom from interference by the general government owning the land and having the only title to the mineral contained in it, gave an opportunity to those initiating and framing legislation to select from the mining codes of all the world their best elements, so far as applicable to the peculiar

[†] Presented to Metal Mining Convention, Western Division, The American Mining Congress, Salt Lake City, Utah, September 7, 1937.

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surroundings of the new situation, whilst the strong sense of right and independence with which this strange gathering was imbued freed their minds from the conventional ideas of particular systems of law, broke the fetters of tradition which would have affected legislation in older and more settled communities, left them freer to act promptly and directly and to choose those regulations which they might determine to be best after discussion, as fairest of all, where all were recognized as equals . . .

"It is asserted that the mining code, as far as it can be traced, has sprung from the customs and usages of the miners, with rare applications of common-law principles by the courts to vary them; or that the origin of the rules and customs of the miners is immediately recognized by those familiar with Mexican ordinances and continental mining codes, and with the regulations of the Stannary convocations among the tin bounders of Devon and Cornwall in England, and the High Peak regulations of the lead mines in the County of Derby; finally, that all these regulations are founded in nature, based upon equitable principles, comprehensive and simple, have a common origin, and are matured by practice. Halleck expressed the opinion that in the main the miners adopted, as best suited to their wants, the principles of the mining laws of Mexico and Spain, by which the right of property in mines is made to depend upon discovery and development, and that discovery is made the source of title, development or working the condition of its continuance, and that these two principles constitute the basis of all their local laws and regulations . . .

"They proceeded upon the theory that the public domain belonged to the people; that the mineral therein was the subject of free private acquisition, as a reward for discovery and occupation; and thus defied in effect the settled traditions and laws of other countries, and the right of the United States as a Government to the mineral contained in its lands."

Recognizing the equity and the force of the early mining codes, the fact that in California particularly the gold miners had done much to settle and enrich the Pacific coast area, that the risks and hazards of this enterprise should be rewarded by permitting ownership of what had been discovered and developed and thus added to the national wealth, Congress in 1866 threw open to exploration and occupation the mineral lands of the United States. This act recognized the validity of "the local customs and rules of miners in the several mining districts, so far as the same may not be in conflict with the laws of the United States." In this year, therefore, what had been technically a trespass was forgiven and legalized. By this act, three important and beneficent principles were established: First, that all mineral lands of the public domain should be free and

open to exploration and development; second, that rights which had been acquired in these lands under a system of local rules with the apparent acquiescence of the Government should be recognized and confirmed; third, that titles to at least certain classes of mineral deposits or lands containing them might be ultimately obtained. By the act, the Government abandoned the idea of exacting royalties on the products of the mines and gave license to its citizens to search for precious and other minerals with some assurance of security in possession and right of enjoyment. Such has been, so far as metal mines are concerned, the national policy since that day.

Benefits of Present System

The operation of this act of 1866 was in some respects not entirely satisfactory. In 1872 it was repealed and the statute was enacted which, without changing the essential principles of the act of 1866, has governed the location and working of lode mining claims practically ever since; and, also, except for important changes beginning with the leasing law in 1920, applicable chiefly to coal and oil, has likewise governed the location and working of placer mines. Under it great mining discoveries have been made. Because of its stimulating effect, billions have been added to the national wealth. From these discoveries value has been created which has furnished additional sources from which the Government derives revenue through the medium of taxation. In fact, it is not too much to say that without the liberal Government policy of enacting into law the basic principles of the old miners' codes, many of the greatest mines in the land would never have been discovered and developed, and the famous camps of Cripple Creek, Leadville, Tonopah, Virginia City, and Butte might still be only points on the map. Moreover, the vast placer fields of California would never have poured into the coffers of the nation their magnificent riches. In a larger sense, these discoveries and others have formed the basis for much of the progress and civilization of the Western States.

Much has been written of the history and influence of mining in the western United States. In 1848 there were hardly more than 50 or 60 white people in the Sacramento Valley, and only 15,000 people in the entire Territory of California; but two years later there were 100,000 people in California petitioning Congress to make it a State. Within the brief space of 20 years, from 1848 to 1868, due largely to mining and the location of mining claims, there was

opened up to settlement a very large territory, valuable as a source of supply not only for the products of the mines but for nearly all of the necessities of man, a region occupying more than one-third of the area of the United States, formerly chiefly known mostly to trappers and traders and traversed and occupied by Indians. But for the mining furor of California, that State might have remained, for several generations, for the most part a vast cattle range; and the great territories that adjoin it, although traversed by railroads uniting both shores of the country, might still be barren wastes. The wealth of Leadville largely built the Denver & Rio Grande Railroad in Colorado and Utah; and had it not been for the vast gold discoveries and development in California, the building of the Southern Pacific would have been delayed for many years. The truth is that agriculture, commerce, manufacturing, and mining are essentially related pursuits, and to encourage and stimulate metal production upon the basis of ownership conditioned upon discovery and occupation is a sound public policy. This principle has become so firmly established in the minds of all mining people and generally in the minds of all residents of the great West that, to them at least, it is axiomatic. Therefore, when the Secretary of the Interior proposes that the system which has served so well for many generations be discarded and that all minerals be made subject to a Federal leasing law, we are entitled closely to scrutinize the proposal, to discover whether or not it will maintain the benefits of our present system.

Proposed Change Will Destroy Enterprise and Initiative

The proposal emanates largely from those who have a mistaken idea of what mining and prospecting consists. To many of the uninformed, every location represents a fortune, because of the vast wealth which has come from a few; but it is a significant fact that in the State of Colorado, of 50,000 claims or groups of claims which, according to the records, have been surveyed preparatory to patent, not more than 1,000 of these have ever made any substantial return to the owner or ever, in fact, amounted to anything at all. In other words, the chances which the prospector takes in putting in his time and money in traveling the hills in search of ore and in the development of his claim to a point where it even merits examination, are so much against him that any discouragement to his enterprise will cause him to abandon it. It has been the history of all independent men, and particularly those who take



Erskine R. Myer



Typical scene of earlier mine development. Transporting lumber to Smuggler Mine, near Telluride, Colo.

their heritage from the ideas and concepts of the early mining days in this country, that they desire, once they have invested their capital, their time, and their efforts to own something, without let or hindrance or unwarranted regulation from bureaucratic Washington. To change the matured practice of permitting ownership of a claim which has been discovered, occupied, and developed, which it has been estimated by governmental authorities has cost at least \$35 an acre, and to substitute therefor a leasing system for all mineral lands, is to discard a system which has proved adequate, equitable, and stimulating for one which will limit and hamper, and by its limitations tend to destroy the enterprise and initiative of the prospector and discoverer at the very time when this country, as well as the world, needs precisely the thing which he is attempting to find and produce.

The amount of money which goes to the Government and which is necessary to bring a claim to the point of patent is by no means the whole story. By the discovery and development of mines, employment is furnished. Products must be transported to and from the mine; supplies are used and consumed, and wealth created in many ways, all of which furnishes a basis upon which taxes may be levied and thus the obligations of Government met. It goes without saying that the amounts which the Government of the United States has received by the creation of such wealth in the form of taxes far exceeds the amount, small to the Government but large to the miner, which is levied upon the discoverer as a direct fee for his patent rights. The argument is often advanced by those who propose a leasing law for all minerals that the Government is giving away, practically for nothing, valuable deposits from which it should receive a royalty; and that therefore

these lands should be leased and royalties paid, instead of made the subject of patent. In view of the figures which I have quoted as to the percentage of successful mines from patented claims, such an argument refutes itself.

Another answer to the proposal for a Federal leasing act for all minerals is to be found in the fact that in the United States mines are not ranked as the property of society, the operation of which is entrusted to the Government. The United States receives its title through cession or treaty or purchase, not, as in the sense of Royal mines, the inherited property of a sovereign. They belong to the people of the United States, and in common with other public lands should be subject to occupation and development. Moreover, mining with us is not a public utility. It is a private industry, and has been so regarded since the birth of the Nation. It should be fostered and encouraged as all other economic industries are fostered and encouraged. The discovery, operation, and development of mines is no more a governmental function than is the cultivation of the soil or the business of local manufacturing. No one doubts the power of the Federal Government to lease or to sell or to permit appropriation of mineral lands upon any terms which it will, but as a matter of public policy, the system which has been in effect for 70 years has proved sound and productive. In this case, at least, why not let well enough alone?

May Lead to Further Control

There is perhaps another aspect of the question which should be considered in connection with the avowed effort and purpose of the present administration to control and regulate all industry and production. This attempt is being made by all sorts of regulatory measures—through the medium of taxation, a na-

tional wage and hour bill, and through the recent unconstitutional NRA and AAA. The purpose is not only to regulate and control those industries so monopolistic in character and so impressed with a public interest that they may properly be made the subject of such regulation, but private industry which does not possess these characteristics. This is so apparent that it is difficult to escape the conclusion that the real purpose of the proposal to subject all minerals on the public domain to a leasing act is gradually and ultimately to extend more definite and specific governmental control of mining, which has always been regarded as a local and purely private enterprise. If there be any such secret or unannounced purpose in the proposal, it should be known now. Otherwise we may find ourselves confronted with a change in national policy by the same methods by which the American people were threatened with a change in the form of their Government, without their consent, in the now defeated but brazen and wholly indefensible attempt to pack the Supreme Court of the United States.

I have intentionally avoided discussing the leasing act of 1920, because it seems to me that the reasons for its adoption do not support the proposal for a leasing measure for all minerals. Certain it is, by reason of leases, the petroleum industry is subject to rigid regulation, but it may be that the Nation is so dependent upon the product of petroleum in matters of national defense that it is in fact impressed with such a public interest that some degree of regulation is justified. However, the history, background, and methods of metal mining and oil production are in no sense comparable, and the reasons for a leasing policy in the one case do not, to my mind, support the proposal in the other. Almost a century ago, in 1849, President Fillmore in a message to Congress suggested some of the difficulties which seemed to be inherent in any governmental leasing system. He said:

"Various methods of disposing of the public lands have been suggested. I was at first inclined to favor the system of leasing as it seemed to promise the largest revenue to the Government and to afford the best security against monopolies, but further reflection and our experience in leasing lead mines and selling lands on credit have brought my mind to the conclusion that there would be great difficulties in collecting rents, and that the relation of debtor and creditor between the citizens and the Government would be attended with mischievous consequences. I therefore recommend that instead of retaining the mineral lands under Government control, that they be . . . sold under such restrictions as to quantity and time as will insure the best price and guard most effectually against combinations of capitalists to obtain monopolies."

The other phase of the general subject of mineral land withdrawals assigned to

me for discussion is not so easy of positive answer, certainly not in the time and space permitted by this paper. Complaint has occasionally arisen because the Government has withdrawn and is continuing to withdraw lands which may contain minerals now subject to location.

Conservational Aspects

The policy of such withdrawals is, of course, closely related to the policy of conservation. That term has been so much abused, so variously defined, and applied in so many different senses that it is difficult to know now what it really means. Conservation may as properly apply to public funds as to any other form of wealth, because national resources may be exploited and dissipated just as dangerously by improvident and wasteful expenditure of money derived from burdensome and stifling taxation by the Federal Government as by any other means. It may be true, as it is often stated, that the pioneers who settled our plains and built our mining camps never heard of the term. It has been the mode at times to describe them even as footpads and thieves who have robbed the Nation of its gift of natural resources. I, for one, cannot accept either such description or accusation as true. Let us remember that in all exploitation there is gain as well as loss. History records that when England was defended principally by the bows and arrows of yeomen, the conservationists of that period were worried about the depletion of the yew trees which furnished the weapons to fight the Teutons. Again and later, Englishmen were alarmed by the depletion of the oak forests from which British ships were built to defend her supremacy on the seas. Indeed, Nelson, the hero of Trafalgar, is related as prophesying their eventual exhaustion and appealing to the nation to conserve them. Today, however, ships are made of steel, and what the demand may be tomorrow cannot be predicted. What is necessary now may be useless then, and, of course, the converse is equally true.

In considering the national policy of conservation as related to metal mining, it is also well to remember that the statement that mining is a one-crop industry is not entirely true. To approach exact truth, it must be modified by other considerations. A rise in price or an improvement in production technique often causes the reaping of what to the mine owner may be a second crop. Moreover, minerals, as a rule, are not destroyed. They are durable goods, and hence tend to accumulate in industry. Gold has value not only because of its rarity but also because it resists oxidation and decay. Other metals

would have a longer life if it were not cheaper to replace them, but such a condition would change immediately if more efficient means were developed to preserve them. Increased use of alloys extends far beyond our expectations of 20 years ago, the utility of our most useful metals. Iron and aluminum are major constituents of the earth's crust, and as to these there seems to be no present fear of exhaustion. Because of technical improvements mining records disclose an ever-increasing production of minerals, even from known deposits, although the deposits themselves decrease in richness and become more and more unfavorably located. At the time of the depth of the depression in 1932, there was much talk of the shortage of gold, but the addition of new gold for monetary purposes to the world supply has been not only astonishing but reassuring. The same talk might have been heard during the depressed periods of the forties, just before California began to pour forth her riches. Cripple Creek, in 1907, fortunately developed high production at the time of an acute but short-lived panic. The same statement is substantially true of the Klondike and discoveries made there. It seems that whenever essential metals are needed, a way is found to produce them, provided their production is stimulated and not hampered by governmental policy. Thus the fear expressed by some professional conservationists that our mineral wealth will

eventually vanish, leaving us poverty-stricken, is based upon a misconception.

Metals Reused

The term "lost minerals" expresses the idea of complete consumption and eventual exhaustion. Practically only the mineral fuels, such as oil, coal, and gas, are consumed with use, and with these we are blessed with a large supply; namely, 99 percent of the original deposits in the form of coal, from which the other two may be manufactured. Of other essential minerals, such as those used in construction, many are available in practically unlimited quantities, while metals, both ferrous and nonferrous, may be used over and over. Indeed, one of the marvels of the present industrial recovery sometimes overlooked by economists is the extent of the salvage of used metals. The extent to which salvage is practiced in American industry is indicated by the fact that in 1929, the year in which the depression began, the metal scrap picked up in the United States for reuse is estimated to have had a value of over one billion dollars.

It is a fair question whether these huge accumulations of useful metals above ground do not far outweigh in value to humanity the gold reserves of our own and other nations. At any rate, these metals are not idle. They are constantly circulating. Retired at times because of obsolescence, they are soon made available for reuse. Iron and steel in a new automobile represent about 40 percent of scrap, and the percentage of reused brass and bronze may rise as high as 60 percent. The skeleton of your new streamlined automobile may contain

the steel of an old locomotive of other days, and the copper vessel that now graces your mantelpiece may once have sailed the seven seas on a ship's bow, and in the meantime served as part of a brass knocker on the door of an ancient house in a New England seaport town. The humble junkyard has added years to the life of metals in the United States.

Since the term "conservation" properly means use without waste of our present natural resources, it follows that it may logically be extended to include making available for use metal deposits which cannot now be worked. Many of our deep mines, though rich in ores, cannot be operated because they are flooded, and because of the large amount of capital necessary to drain the areas in which they are located. It would seem proper to suggest that in some cases, at least—for example, at Leadville and Cripple Creek—the Government might more sympathetically consider proposed projects to unwater these mines by the

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New Interior Building, Washington, D. C.

CONSERVATION[†]

By JOHN W. FINCH *

IN EVERY democracy, governmental policies must necessarily reflect the composite ideas of the people as a whole, and it follows as a matter of course that such policies must change to meet changing ideas as needs and circumstances alter with the times. During the early history of our country, the primary need was for growth—for expansion. The original colonies and the vast western territory acquired in the early years of the Republic offered a seemingly inexhaustible supply of minerals, forests, and wild life, and the possession of these resources determined the policies that governed pioneer economy.

Liberal Policy Aid to Expansion

The public lands of this vast, unused, unsettled, and only partly explored domain were sold for revenue to support the new Government or were given free to pioneers to encourage settlement. Liberal donations for the support of education and government were made to the several new States as they were admitted to the Union. Other grants were made to stimulate building of railroads across the far-flung empire. However, it must not be forgotten that the overwhelming sentiment of the country at that time was directed toward satisfying a land-hungry population that looked upon America as a country of limitless opportunity. And no one can deny that without this policy of exploitation the

western country of fertile farms and populous towns, which today afford profitable markets for eastern manufacturers, might still be in large part an arid, barren waste.

The first settlers cut down forests to build their homes and to clear land for their crops. Often they cut too widely and too recklessly, but this occasioned no criticism then, and no attempt was made to exercise any sort of control. For generations, too, unchecked lumbering without selection, which would have allowed the trees to reproduce and removed only ripened timber, destroyed not only the forests but the wild life they sheltered, and seriously impaired the effectiveness of watersheds over quite large areas.

In the Middle West, the early settlers found lush grasses that reached to their saddle stirrups where today, through misuse, short blades are so thinly scattered that in some places it requires as many as 15 acres to graze a single steer. Here, too, unchecked farming, which destroyed the protective mat of acclimated vegetation, is now paying the price in soil erosion and dust storms that already have brought disaster to formerly prosperous groups.

Exploitation of our mineral wealth began when the Forty-niners found the yellow gold of California. The very munificence of our supplies encouraged profligacy in their use. If one could skim the cream of a mineral deposit that had been built up by the ages, and move on to the next, there was no incentive

[†] Presented to Metal Mining Convention, Western Division, The American Mining Congress, Salt Lake City, Utah, September 7, 1937.

* Director, United States Bureau of Mines.

to take out any ore that did not show an immediate profit, or to devise improved machinery or more effective methods to get the remainder, which was often irrevocably lost by such hasty methods.

The early history of oil repeats the same thing many times. Flush production and waste of natural gas left 75 percent of the oil in the sands; even today not more than half of the oil is recovered, although it should be said in fairness that the industry is constantly striving to increase the percentage.

However, at the turn of the present century Theodore Roosevelt and other public-spirited leaders began to foresee the ruin that must inevitably result from wasteful exploitation and to realize that as a nation we must direct ourselves to conserving the remainder of our publicly owned resources. Changes for the better that germinate in the minds of forward-looking leaders require time to prevail against long-held and customary opinions of the majority. But today it is generally realized that a conservation policy is necessary, fully as much for the preservation and well-being of our present population as for the benefit of future generations.

Conservation Defined

True conservation means first of all the prudent use of our natural resources without waste or needless destruction, and that these resources, so far as not inconsistent with our own needs, shall be preserved for the needs and enjoyment of future generations of Americans. It does not mean withholding of our national resources from use, for carried to the extreme, this theory would have prevented the development of the country, just as now it would mean stagnation or retrogression.

True conservation can be established on a sound and permanent basis only by adopting it as a national policy and concentrating responsibility for it. Uniform principles would thus become established, economy of operation would permit greater accomplishments with the funds expended, and, of more importance still, the danger of exploitation would be minimized, because policy and precedent would create protective grooves that the greediness of any group of exploiters would find it difficult to disregard.

Federal Departments Administering Public Lands

Under the present administrative set-up the public domain, in general, is administered by the Department of the Interior, but there are large and rapidly expanding areas set aside as reserves to preserve the forests and protect watersheds that are administered by the Department of Agriculture. The agencies in the Department of the Interior dealing with public lands and their functions include the General Land Office, the Geological Survey, the National Park Service, the Reclamation Service, and the Division of Grazing. The agencies in the Department of Agriculture dealing with conservation work in

the Federal lands are the Bureau of Public Roads, the Soil Conservation Service, and the Forest Service.

The General Land Office is concerned with matters pertaining to homesteads, Indian lands, cadastral surveys, and land patents.

The Geological Survey comprises the geologic, water resources, topographic, conservation (land classification and mineral leasing), and Alaskan branches.

The National Park Service has as its duty the preservation and protection of areas of beauty, historic interest, and recreational and educational value. Incidentally it administers forestry in the Federal parks in a manner parallel to that of the Forest Service of the Department of Agriculture in other areas.

The Reclamation Service is charged with the duty of storing and dispensing water in the arid regions of the country.

The Division of Grazing administers grazing privileges on 80,000,000 acres of public lands (other lands contributed to the grazing districts by miscellaneous claimants bring the total to about 200,000,000 acres), studies prevention of soil erosion, and takes other measures for conservation of the ranges.

Although the Bureau of Mines, which is also in the Department of the Interior, has no part in the actual administration of the public domain, it is specifically authorized by law to undertake conservational activities through investigations concerning the mining, preparation, treatment, and utilization of mineral substances with a view to improving health conditions, increasing safety, promoting efficiency, fostering economic development, and conserving resources through prevention of waste in the mineral industries. It is also interested in power developments for mining and in roads as factors in mineral discovery and mine operation.

The activities of the Bureau of Public Roads, in the Department of Agriculture, are not concerned primarily with the public domain, but much of its work is done on lands still owned by the Federal Government, even including road construction in national parks, which properly belongs to the National Park Service.

The Soil Conservation Service as constituted studies watersheds and soil erosion prevention. The latter is due largely to cultivation of the land, therefore it is not called for to a great extent on the public domain unless such land is denuded of forests or the protective covering of turf.

The Forest Service includes the following divisions administering national forests on the public domain: Fire control and improvements (including construction of forest roads), timber management, range management, recreation and lands, engineering, and wild-life management.

Plea for Department of Conservation

I believe it will be obvious, even from this brief analysis of functions, that there are two departments with widely divergent viewpoints and objectives that

deal independently with questions of public-land use and nonwasteful utilization of timber, grass, and mineral resources. This work is often done in adjacent areas. The impossibility of developing a unified governmental policy under these conditions leads inevitably to confusion and waste. The Department of the Interior for many years has been preeminent in conservation. If a national conservation policy is to be followed seriously, as self-preservation demands, this department furnishes the natural agency within which to concentrate conservation activities.

In the minds of many people, especially those living in the East, conservation means forests. The reason for this is that the policy of conservation of our

such clashes could be avoided and much of the present delay in development would be eliminated.

The construction of roads and trails into areas classified as mineral lands in the forest reservations is vital to prospecting and mineral development. Those built by the Forest Service are generally designed for forest administration. They might be so constructed as to serve both the forests and the mining industries. Water in the forests can be used by mining people for domestic and power purposes after negotiating with the Forest Service, Power Commission, Bureau of Reclamation, and in some cases the War Department where navigable streams are concerned. Much simplification might be accomplished if all, or a major part, of the administration of water resources were under a single Department of Conservation, authorized to handle all matters relating to natural resources and to formulate and execute long-term policies.

Research has proven to be an essential activity in promoting the conservation of forests as in the conservation of other resources. However, the regular research organizations of agriculture did not meet the requirements of forestry, and therefore a special research organization had to be established to satisfy the needs of forestry and the wood-using industry. It could be transferred to the unified conservation agency without loss or inconvenience to it or to the normal research work of the Department of Agriculture.

A committee was appointed by the President to study the matter of conservation in reference to the reorganization plan for the Executive departments. In its report the committee states that conservation today represents a major purpose of our Government and recommends that it be made a department of the Government to replace the Department of the Interior. In outlining the purpose of the proposed Department of Conservation, the committee says that it is to advise the President with respect to the protection and use of the natural resources of the nation and the public domain; to administer the public lands, parks, territories, and reserves; and to enforce the conservation laws with regard to public lands and mineral and water resources.

If the proposed Department of Conservation as outlined in this report were to be created, it would centralize the administration of the public lands on the basis of purpose rather than the historical accident of initiation and development of the several agencies, and that purpose would become the central driving force of the organization. The management of the public domain would no longer be divided between departments having imperfect contacts and separate objectives, and those engaged in the study of our natural resources and in their administration to insure best utilization in the light of true conservation would be able to work shoulder to shoulder, not separately, or with divergent and often conflicting aims.



John W. Finch

national resources, as announced by Theodore Roosevelt when he was President, related to forests. Forest reserves primarily represent lands not suitable for cultivation, but in many cases they include mineral deposits of value, and a large part of them is suitable for grazing and is so utilized under forest regulations. The determination of the relative value of mineral lands and the proper conditions of permissible development are far afield from matters relating to forest culture. Since the Department of the Interior deals with mineral leases, mining rights, and regulations on other Federal lands, it is logical that it should handle all matters relating to mineral development in forest reserves in order to carry on a single, consistent program.

Prospecting, locating, and developing mineral resources in forest reserves are lawful, "Provided, That such persons comply with the rules and regulations covering such forest reservations." That proviso has been the source of much dissatisfaction. If mining and forestry were in the same Federal department,

Analysis of Proposed Wage and Hour Legislation[†]

By EDWARD H. SNYDER *

THE President sent a message to Congress on May 24 requesting the enactment of minimum wage and maximum hour legislation.

Immediately after the reading of the message, Senator Black and Representative Connery introduced identical bills in the Senate and House, respectively, designated as Senate Bill 2475 and H. R. 7200.

No purpose will be served in giving this audience a detailed analysis of these bills in the form in which they were introduced. After careful study my conclusions are that the real purpose of the authors of these bills was:

(1) To centralize power to control all industry in a board to be appointed by the President.

(2) To further promote the interests of those organizations that collect tribute from the working men of the United States.

Rumors in the press indicated the C and C boys prepared them with the idea of giving Congress plenty of provisions to strike out, and at the same time to show the patients from whom the extractions were to be made an array of horse forceps, so that said patients would be reasonably quiet when the doctors actually began work with less awe-inspiring tools.

Provisions of the Act

Senate Bill 2475, as reported by the Senate Committee on Education and Labor and passed by the Senate, provides for the creation of a Labor Standards Board of five to be appointed by the President with the advice and consent of the Senate, and *delegates power to said Board*:

(1) To determine and define so-called "fair labor standards" for all industries the products of which enter interstate commerce, with the exception of agriculture, fishing, and rail, motor, and air transportation industries, subject to Hours of Service Act, Motor Carrier Act, or Railway Labor Act.

(2) To ban goods produced in whole or in part by use of child labor from interstate commerce.

(3) To prevent admittance to interstate commerce of goods produced under

conditions of so-called "unfair labor standards."

It is declared to be the policy of the Act to maintain so far and as rapidly as is economically feasible, minimum-wage and maximum-hour standards, at levels consistent with health, efficiency and general well-being of workers and the maximum productivity and profitable operation of American business.

The Board's powers are limited as to the establishment of minimum wages by Section 4(b) of the Act which provides the application of the minimum wage provisions shall not curtail opportunities for employment, and that the Board's jurisdiction shall not include power to declare minimum wages in excess of 40 cents per hour.

As the minimum wages now being paid in the mining industry range from 25 to 65 percent higher than the highest minimum wage that could be established by the Board under the provision outlined above, and the breadth of the markets for the products of our industry greatly increase with the average standard of living, the establishment of a minimum wage of 40 cents per hour would not hinder, but on the contrary would benefit our industry, provided this minimum could be established in other industries as the Act states, ". . . without curtailing opportunities for employment and without disturbance and dislocation of business and industry." Unfortunately the writing into an Act of Congress a stipulation of this kind cannot change human nature or the fundamental natural laws governing economics.

As to the maximum hours, section 4(c) of said bill reads as follows:

"Having regard to such policy, and upon finding after notice and hearing, as hereinafter provided, that the application of the maximum work week provision of this Act to any occupation or occupations *will not curtail earning powers*, the Board shall by order from time to time declare for such occupations a maximum work week (and the maximum work day therein), which shall be as nearly adequate as is eco-

nomically feasible, without curtailing earning power, to maintain health, efficiency, and general well-being: Provided, That the Board's jurisdiction in declaring maximum hours *shall not* include the power to fix maximum hours less than 40 hours per week, but shorter maximum hours fixed by collective bargaining or otherwise shall be encouraged; it being the objective of this Act to reduce the maximum working hours of the group now working excessively long hours, so as to attain the maximum work week of 40 hours as rapidly as practicable *without curtailing earning power and without reducing production. . . .*" (Italics are mine.)

I call attention to the fact that this provision in *no way limits* the power of the Board to establish a maximum working day less than eight hours.

Paragraph (a) of Section 6 of said bill provides an "oppressive" work week shall not constitute a substandard labor condition, providing employees are paid time and one-half for time worked in excess of the maximum week established by the Board, but the Board shall have power to make an order determining such so-called overtime a substandard labor condition if and to the extent the Board finds necessary or appropriate to prevent circumvention of the Act.

The provisions outlined above are identical with those in the House bill as reported by the Committee on Labor, which bill was bottled in the House Rules Committee and did not reach the floor of the House during the last session of Congress.

Section 17 of both Senate and House bills provide:

"Any (provision of any) contract, agreement or understanding made in violation of any provision of this Act or of a regulation or order thereunder shall be null and void."

My interpretation of this is that no wage earner would have the right to contract his services on a basis that in any way conflicted with regulations or orders issued by said Labor Standards Board.

[†] Presented to the Annual Metal Mining Convention, Western Division, The American Mining Congress, Salt Lake City, Utah, September 10, 1937.

^{*} General manager, Combined Metals Reduction Co.

In other words, if this legislation is enacted, a wage earner's time must be sold in accordance with the regulations of said Board.

The House Committee on Labor altered the Senate bill to insure: That interested parties would receive notice of hearings by registered mail, instead of having to read the *Federal Register* to determine if they were on trial; that hearings should be held at a point as near the place of business of the employer involved as is practicable; that at least 90 days' notice from the date of order must be given before any change is made effective if it increases wages or reduces hours.

The House Committee also amended section 5 to provide:

"The minimum wages and maximum work week established by collective bargaining agreements in any occupation shall be *prima facie* evidence of the appropriate minimum wage and maximum work week to be established by the Board for like work under substantially like conditions."

Time does not permit dealing with the child labor provisions of these bills, none of which will directly affect the mining industry, nor with the "adequate" provisions made for delegating power to the Board for administering and enforcing the Act.

Both the Senate bill as passed by the Senate and the House bill as reported by the Committee on Labor contain numerous indefinite provisions for "scenery," the application of which are optional with the Board or the Administration. In this class is one relating to tariffs on imports, and another providing for appointment of an advisory committee, the recommendations of which may be followed or disregarded at the option of the Board.

The hazard of the enactment of the essential terms of these bills is great. For this reason, I wish to present for your consideration some basic facts governing the mining industry and my analysis of the effect the enactment of the proposed wage and hour legislation would have on our industry and the public we serve.

Effects on Mining Industry

(1) The average rate of wages in the mining industry is now higher than at any previous period. Employment has increased 127 percent and rates of pay 86 percent above the 1933 low, according to a recent report of the U. S. Bureau of Labor Statistics.

(2) The producer of basic raw materials, such as minerals and metals, cannot raise the selling price of his products to meet increased costs, but must sell in a broad, competitive market in which prices are determined by world conditions.

(3) The wages of most of the employes in western mines are on a sliding scale governed by the prices of the metals they produce.

(4) The industry is now paying the highest prices in its history for most of the equipment and supplies it uses.

(5) Employment in our industry changes rapidly, with comparatively small changes in the difference between the cost of production and the mine value of the products.

(6) The standard working day in metal mines is the so-called eight-hour day, which in most cases involves less than seven hours actual working time at the working places. For reasonable efficiency and safety, a complete mucking, drilling, and blasting cycle must be performed each shift, and many operators are experiencing considerable difficulty performing the cycle in the limited time now allowed by state "collar-to-collar" laws. Shortening the work day further would decrease safety, add greatly to the cost of production, and thereby decrease employment.

(7) Establishing of a five-day week in western mines instead of creating new wealth and new jobs would:

(a) Decrease the earnings of the employes by \$300 to \$400 per year and thereby create strife.

(b) Decrease production of mineral products at a time when full-time capacities of mines and treatment plants are needed to supply the nation.

(c) Increase the cost of production and thereby decrease real employment

exists in practically every camp in the West, and increase further the accident rate by forcing the industry to use an excessive percentage of inexperienced men.

I refer those of you not familiar with mining who wish more detailed information on the above facts to the competent secretary of the American Mining Congress.

High *yearly* earnings of employes in any industry made possible by efficient production, automatically increase employment in other industries. Low *yearly* earnings of employes in any industry due to short-time employment, coupled with high wage rates per hour or per shift destroy industry and decrease employment.

With the above facts in mind, it is apparent that an order issued by the proposed Labor Standards Board establishing a five-day week for our industry would immediately *curtail the yearly earning power of employes* contrary to the stated policy of section 4(c) of the proposed bills, unless the industry raised wages by 20 percent. The raising of wages by 20 percent would automatically *reduce production* and decrease employment, which is also contrary to section 4(c) and the policy of said Act.

At the option of the Board, some mines might be allowed to work an "oppressive" work week of six days by paying time and one-half for the sixth day. This penalty, equivalent to an over-all wage increase of 8 1/3 percent, would again force a reduction in production, and curtail the yearly earnings of those employes whom the mine operator could not afford to employ on the sixth day at time and one-half. This would also be contrary to the policy of said Act and violate section 4(c). In the minds of some, bad politics would also be involved in permitting an industry to work an "oppressive" six-day week, as this would decrease the gross "take" of union dues by 20 percent.

Men Oppose Five-Day Week

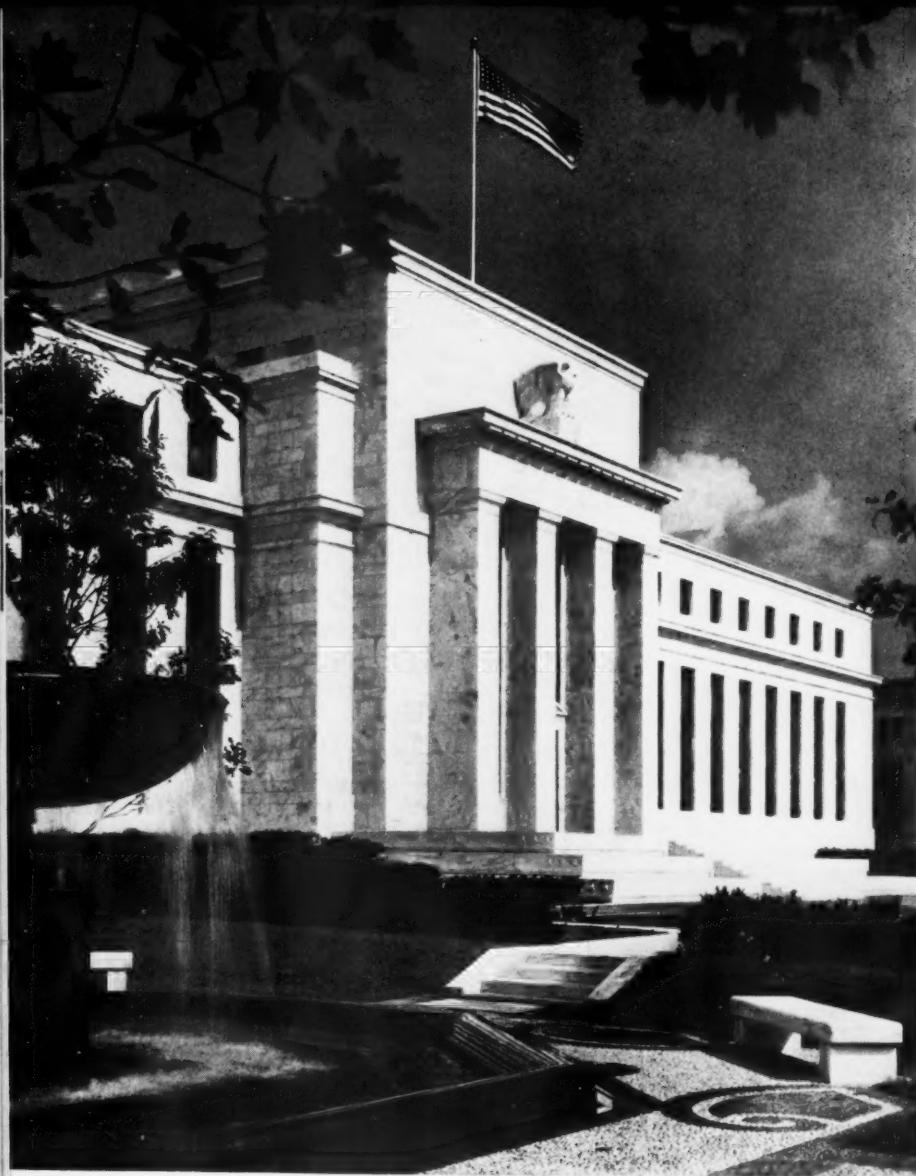
In this connection, I wish to state that a large majority of the men employed by our companies are strongly opposed to the five-day work week. Their union leaders, however, are promoting this unsound expedient for the benefit they, and not the men, will derive therefrom.

We propose to continue to keep our men informed, so that they may properly judge any action taken by members of Congress during the next session. We have no trouble convincing employes that a reduction of \$300 to \$400 in their yearly earnings is not to their advantage, even though they receive a higher rate per hour or per shift.

An honest administration of the Act based on all of the facts would, therefore, leave the Board no alternative except to issue no orders affecting the wages and hours of the mining industry.

A dishonest administration of the Act, or one based on half truths and propaganda, might cause it to issue orders

(Continued on page 38)



Federal Reserve Building, Washington, D. C.

Wheels of Government

As viewed by A. W. Dickinson of the American Mining Congress

THE convening of the Congress in special session on November 15 has been preceded by increasing indications that the rubber stamp days are waning. The business recession of the recent months has been felt in the majority if not in all of the Congressional districts and states. The members of Congress have returned in a sober frame of mind and it will be remembered that when they departed after the adjourn-

ment on August 21, they were in anything but a happy mood.

The call has been sounded from far and near for a let-up on restrictive and punitive measures against business enterprise and for the initiation of steps to encourage business recovery and expansion as the only possible known means of counteracting the recession. It is now realized that "spending our way out of

the depression" cannot be carried on as the banner of the present and the future.

Stalwart Democratic Senator Harry Flood Byrd of Virginia lead off before the Academy of Political Science in New York on the night of November 10 by calling for a halt in governmental spending. He called attention to the direct gross debt of over \$37,000,000,000 as of November 6, and to the contingent liability of \$5,000,000,000 of the 25 wholly owned Government corporations and the partially guaranteed obligations of 10 semi-Government corporations. On the same program, Senator Byrd was followed by Secretary of the Treasury Morgenthau who stated plainly that expenditures must be curtailed and that tax revisions must be made to restore confidence and improve the status of business enterprise.

The morning of November 11 brought Senator Pat Harrison's telegram to Secretary Morgenthau. As an expression from the Chairman of the Finance Committee of the Senate, the telegram has deep significance. Senator Harrison said, "the administration should fight . . . to restore confidence to business, extreme emergency measures should be checked and the budget balanced. There must be some modifications of the undistributed profits tax." From the further wording of the message it is believed that Senator Harrison and his colleagues are resolved to stand firmly for their beliefs of what is necessary to curtail expenditures and relieve harmful taxation practices.

Reiterating his request for action on agricultural relief, labor legislation, Government reorganization and regional planning, the President's message of November 15 to the Congress carried a sobered tone. His words "Since your adjournment in August there has been a marked recession in industrial production and in industrial purchases . . ." were deeply significant. On the subject of taxation the President said "Unjust provisions should be removed (from the law) provided such removal does not create new injustices." In discussing the labor situation he stated that uniform minimum hour or wage standards are not an immediate requirement but that legislation to that end is an ultimate goal.

The message was quietly received by the Congress, and in settling down to routine the House and Senate spent the first week of the five-week special session in early adjournments or in quarrelsome debate, while waiting for the Farm Bill which was the primary reason given for calling the session. In the Senate, the Antilynching Bill caused bitter outbursts from the southern states, and if the issue is not side-tracked by the arrival of an agricultural aid bill, the situation threatens Democratic unity almost as seriously as did the Supreme Court controversy of the past session.

Taxation

The sobering influence of the business recession, coupled with the storm of protests which has been gathering since the

enactment of the undistributed earnings tax in the Revenue Act of 1936, has caused a distinct change in attitude on the part of the administration, the Treasury Department and the Congress. With the opening of the special session the strong feelings of Senators and Congressmen against the restrictive influence of the present Revenue Laws on business enterprise were made known through addresses on the floors of both Houses, and through numerous bills introduced to amend and revise these laws.

In the meantime the subcommittee of the House Committee on Ways and Means has been laboring diligently with the representatives of the Treasury Department and with the staff of the Joint Committee on Internal Revenue Taxation to carry out the expressed will of the Congress. Up to the present time, consideration has been given to the undistributed corporate earnings tax, the capital gains tax, the capital stock and excess profits tax, the securing of revenue with relation to the interest on tax exempt securities, and the collection at source (by employers) of tax on incomes of less than \$5,000. On some of these items the subcommittee has reached tentative agreements. In the case of the tax on undistributed corporate earnings the Committee has agreed to exempt those corporations whose earnings do not exceed \$5,000 annually. Serious consideration is being given to extending this exemption up to earnings of \$25,000 and modifications are under discussion for larger earnings on the basis of flat or percentage exemptions.

In revising the capital gains tax, agreement is reported on allowing the taxpayer to carry losses forward for one year. There is also a plan to permit the carrying over of corporate operating losses for one year in computing the undistributed earnings tax.

The Committee has agreed to lower capital gains taxes of individual taxpayers on the sale of assets held for more than three and one-half years and less than five years. The following schedule shows the taxable portion of a \$100 capital gain under the provisions of this agreement and also under the present law:

Asset held	Present law	New plan
Less than 1 year.....	\$100	\$100
1½ years	88	80
2 years	76	80
2½ years	70	60
3 years	64	60
3½ years	58	60
4 years	52	60
4½ years	46	60
5 years	40	60
5½ years	40	40
10 years	40	40
Over 10 years	40	30

A choice of two methods would be given to the taxpayer in computing his capital gains tax. He could take the re-

quired portion into his individual income report in the usual way and pay the tax required on the basis of his particular bracket, or he could segregate his capital gains and pay a flat 40 percent tax on the taxable portion. His choice in the matter would depend on whether his regular individual tax rates on the capital gains involved would amount to less than 40 percent or more than 40 percent.

The subcommittee has also given serious consideration to the repeal of the capital stock and excess profits taxes, but the loss of \$140,000,000 in revenue which would result from such action is considered a serious obstacle. Chairman Vinson is quoted as saying that he considered the repeal of this tax as a business relief item because the tax is in the nature of a capital levy which corporations must pay whether they have income or not. Making the problem particularly difficult for the subcommittee is the requirement of the administration and the Treasury that all losses in revenue due to tax relief measures be replaced by revenue procured through other means.

The practice of New York state in collecting the tax on incomes at the source has been considered. If the Federal Government were to adopt this method on incomes of less than \$5,000, it would undoubtedly result in decreased cost of collection and in increased revenues. While it would place some burden on the employer, it would be certain to result in a measure of increased tax consciousness on the part of the small taxpayer. No decision by the subcommittee is reported on this suggestion but it is known that Chairman Vinson has considered it seriously.

Up to the present time the subcommittee has not entered into the consideration of the Treasury's recommendation that Percentage Depletion be eliminated. Committee studies of this subject may not come for some weeks. In the meantime a statement of the position of the mining industry on Percentage Depletion, prepared by the Tax Committee of the American Mining Congress, has been given wide distribution among mining men throughout the country. There has been an excellent response to the suggestion that our members, and all others interested in mining, inform themselves and communicate their views on the continuation of the present Percentage Depletion provisions to their Congressional delegations. *If you have not received and carefully read the green booklet entitled "Percentage Depletion—The Position of the Mining Industry," we urge you to communicate with this office at once and copies will be furnished immediately.*

Wage-Hour Bills

The Congress came back with an increased dislike for the enactment of wage-hour legislation. They know that the elimination of child labor is beyond the point in discussing this subject. There is legislation which deals with the child labor question and which can be separately enacted at any time. To the repeated comments that the Black-Connery Wage-Hour Bill was bottled up in the

House Committee on Rules, Chairman John O'Connor of New York State finally defended, "Who wants the bill anyway?" Chairman of the House Committee on Labor, Mary Norton of New Jersey, as the ostensible administration agent, has secured somewhat over 150 signatures on a petition circulated among the House members to discharge the Committee on Rules and bring the bill out on the House floor. It is the present Washington opinion that the required 218 signatures to the petition cannot be secured. Of outstanding importance in the legislative course of the bill is the fact that the agricultural and stock raising elements of the country are against it—they do not want wage-hour legislation. The Congressional delegation from the southern states are definitely against the bill. Allegedly under administration pressure one element of organized labor is giving "lip-service" approval to the measure, but William Green declared on November 22, that the American Federation of Labor could not and would not endorse the bill in its present form. He said that for labor the present business recession has assumed the proportions of a serious depression and demanded a shorter work day and a shorter work week to meet the unemployment situation. Stating that the present draft of the Black-Connery Bill should be returned to the House Labor Committee for amendments or that a new bill be substituted for it, Mr. Green, after criticizing the National Labor Relations Board, stated in his letter to Chairman Mary Norton that "it is no longer safe to permit a Government Board of that kind to make the many determinations necessary in the administration of the Fair Labor Standards Act as now written." He further spoke of the suggestion that a minimum wage and maximum hour statute be administered by the Department of Justice or by the Federal Trade Commission, and in so speaking, he did not register objection to such a procedure.

In the meantime, Representative Lamneck of Ohio has introduced H. R. 8351 which is entitled "The Wages, Hours and Child Labor Act of 1937" which provides for the correction of "substandard labor conditions" and "oppressive child labor" under the administration of the Federal Trade Commission in dealing with these matters as "an unfair method of competition in commerce." Of particular interest in the Lamneck Bill are the factors used in the determination of an "oppressive wage." Among these are the cost of living in the community, considerations by which a court of law would determine "value of services," wages for comparable work in the same general locality established by collective bargaining, and wages for comparable work in the same general locality paid by employers maintaining minimum-wage standards. Included in the determination of an "oppressive work-week" are the physical health, efficiency and well-being of workers, the numbers of workers available for employment, and hours for like work in the same general locality established by collective bargaining. Also

to be considered are the financial condition and previous five-year's record of earnings of the employer as well as any other considerations deemed relevant by the Federal Trade Commission. The bill further provides that no one of the conditions specified shall be considered as strictly governing, since the purpose of the bill is to provide a fair wage and reasonable hours of work compatible with continuity of employment for the maximum number of workers, and with due regard to the maintenance of fair and reasonable profits to the employer.

Representative Connery of Massachusetts, brother of the late co-author of the Black-Connery Bill, has introduced a measure which would make it unlawful to employ in the production of goods to be shipped in interstate commerce, any person for more than 40 hours per week or at a wage of less than 40 cents per hour. The bill also includes the prohibition of child labor, and has an important clause by which entry into the United States of comparable or competitive products produced under conditions contrary to its provisions would be refused.

Stream Pollution

The Vinson Water Pollution Bill (H.R. 2711), after passing the House and Senate in the last session of the Congress, is still in Conference Committee. It contains the harmful Lonergan amendments of the Senate, which provide for the classification of navigable waters into districts, for the fixing of standards of purity for navigable waters and tributaries, and for promulgation of regulations by a Federal board governing discharge of matter or material into such

waters. These amendments also declare discharge of waste into navigable waters or tributaries to be against the public policy of the United States and to be a public and common nuisance, and after expiration of three years charges United States attorneys bring action in district courts to provide or abate any such nuisance, and removes limitation on any person or public body to bring action for damages on account of pollution. At the close of the last session, the House and Senate conferees were deadlocked on the bill. The House conferees under the Chairmanship of Judge Mansfield of Texas stood firmly for the original Vinson Bill as passed by the House. It will be remembered that this is a planning and survey measure, with its administration placed in a board of engineers under the Public Health Service. Industries generally are in favor of the enactment of the original Vinson Bill. Senator Lonergan and the Senate conferees are understood to be standing firmly for the inclusion of the Lonergan amendments. Up to the present time there has been no call for a further meeting of the conferees.

Bituminous Coal Commission

The submission and withdrawal of the resignation of Chairman C. F. Hosford, Jr., have accompanied a period of work in the course of which average costs of bituminous coal of \$2.15 and \$1.79 have been established as weighted average production costs for districts No. 1 and No. 2, respectively. These costs are based on the year 1936, and the two areas covered comprise the preponderance of bituminous coal tonnage for the United States, included with the exception of

Alabama, all of the coal producing states east of the Mississippi River. It is anticipated that the Commission will take the final step and establish minimum prices before the end of December.

In the meantime throughout the country coal has been and is being sold practically on a spot-price basis as the result of an order by the Commission some months ago prohibiting the making of contracts in excess of 30 days duration.

Foreign Trade Agreements

In the announcement of its intention to negotiate foreign trade agreements with Norway, Great Britain and Canada, the State Department has entered upon a field of interest to mineral producers. From Norway came the ferro-alloys in quantity sufficient to be of importance. Canada is a producer of lead, zinc, copper and other metals and minerals of which there is also a large domestic production. Mining is continually encouraged by the Canadian government and additional ore bodies and mineral deposits are brought into production yearly. Any thought of reductions in duties levied by the United States carries with it the certainty of enforced cessation of operation of many of our marginal properties with resultant restriction in production of essential minerals. It is well-known that it requires much time to rehabilitate idle mines, and it is also a fact that when prices are depressed through lower duties, the work of finding new ore bodies lags or ceases. The mining industry will watch with apprehension any indication of an intention to subject the duties on important mineral products to reductions, particularly in view of the international situation at this time.



Analysis of Proposed Wage-Hour Legislation

(Continued from page 35)

reducing the work day below the so-called eight-hour shift with disastrous results.

The same basic economic principles that make the Act unworkable as far as the mining industry is concerned will also make it unworkable in application to other raw material industries that cannot control the selling price of their products. These industries and mining should be placed in the same class as agriculture and fishing, and excluded from the operation of any law designed to control wages or hours of employment.

I do not pretend to be competent to judge what the effect would be of the application of the proposed wage and hour law to manufacturing industries that can pass increased costs of production to the consumer. At the best, I am

of the opinion this would tend to increase the cost of living, make for inflation, increase imports, and decrease the sale of American goods in foreign markets.

The one advantage that can come from this proposed legislation is that its enactment will reduce the time required for this country to discard the unsound theories of those who state that we can have more by producing less.

NIRA Experience a Lesson

Unfortunately for the good of the nation, the NIRA was ruled illegal before the public generally had an opportunity to record the data produced by this experiment, and to observe the impossibility of enforcing the scream of the Blue Eagle. On what ground shall we assume that the Labor Standards Board will not make far more mistakes than were made by the code authorities in their futile attempts during NRA to regulate the

hours and wages of industries with which they were familiar?

Our industries are too complex and vary too greatly for any board, no matter how honest and unprejudiced its members may be or what their past experience has been, to be given the potentially dangerous powers to regulate our very existence through the power to regulate hours of employment and rates of pay.

The question of whether the proposed Black-Connery bill is in conformity with the Constitution, I leave with the lawyers.

If Congress has the power, should it exercise it to create a Labor Standards Board to destroy a substantial portion of the wealth of the nation by confiscating two days out of every seven of the time of all the employees of those industries whose products enter interstate commerce? Is the matter of personal liberty involved in creating conditions to force an individual to loaf two days per week? You tell them!



What's on the Worker's Mind Today†

By WHITING WILLIAMS *

CAN imagine that I don't have to give much explanation as to the amount of courage that it takes these days for anybody to try to answer the question, "What is on the Worker's Mind Today?" But the introduction that the chairman gave makes it a little easier to explain that back in 1918 I found myself as Director of Industrial Relations of a 4,000-man steel plant without getting much assurance that I was crossing the gap between the mine management and the men, so I thought perhaps I should go out and learn how to get over that gap by becoming a common laborer.

I have always had to explain that even though my friends were very pessimistic about my being able to present myself and be accepted as a common laborer, I was so fully and quickly accepted by my common labor friends that they positively hurt my feelings, and instead of the hundreds that my friends supposed would be able to puncture my disguise, only one man did it, back in 1919, and I thought that was not quite fair because he was, at the moment, intoxicated. It was the same in 1920 in Glasgow and London; the same in the mines of North France and later on in

the mines of the Ruhr and Saar Valleys of Germany.

Present Controversy a Selling Contest

I wish there were more time to go into some of my experiences but I must also make mention of a certain part of my background. However, it is from the background of the years since 1918 of bumming, of working, of coal mining, etc., from which I wish to discuss the question, "What's on the Worker's Mind Today?", because as I see it, we are witnessing today what can be called a nation-wide selling contest between the employer on the one hand and the labor leader, more or less assisted by the government on the other, for obtaining the good will, confidence and cooperation of a certain customer known as the worker there in the mines and plants.

This cooperation is absolutely indispensable if high wages are to be paid and at the same time low costs are to be enjoyed; yet in this selling contest the employer, because he has so long given more attention to the customer in the market than to the customer in his own plant, reveals the two errors often made by the inexperienced salesman. One of those is the mistake of paying his competitor (in this case the labor leader) more attention than he pays his customer. A green salesman always does that. Today throughout the entire coun-

try the labor leader is being taken much more seriously than he deserves to be taken, while the customer, the worker, is being taken by the employer in particular and by the public in general, much *less* seriously than he deserves to be taken. This error, bad enough in itself, is made worse by the second mistake; namely, that the employer, the public and also the Federal legislators are today expecting to learn more about this customer, the average typical representative working man, through the testimony of labor leaders than by getting into contact with that customer, himself, in person.

Troubles Arise from Small Grievances

One of the most serious phases of this particular error is that the public, the employer, and particularly the legislator, are all being persuaded that the gulf between the employer and the employee is practically impassable, because it is filled with huge, complex, historic, class-wide issues. In my opinion this is simply not true. On the contrary, I find that the difficulty is very largely made up of small, comparatively insignificant, individual grievances—so much so that where these do not exist the problem is enormously more simple than anybody is apt to believe.

I can understand how the public has been persuaded as to the tremendous importance of the big class issues. It is

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* Industrial Relations Consultant, Cleveland, Ohio.

true that during the last four years since NRA, it has been easier for the leader with a very small minority talking about a small number of large issues, to start trouble than ever before in our history. But at the same time I observe that a strike as pulled by this small minority and the leader doesn't secure any gains such as are required for helping the minority to gain permanent control of the situation unless this minority has the cooperation of a much larger number. If this is lacking, then the strike fizzles out and does very little good for the leader. If the leader is going to secure gains which enable him to go before a group of workers afterwards and say, "See what I got for you," then it is essential that the leader's issues must be supported by the grievances of a middle-road group that I like to call the "sixty percenters." You are everywhere likely to have a 20 percent young, more or less irresponsible, slightly experienced pro-union group at one end. You are also likely to have a group of the older, more responsible 20 percent pro-company men at the other end. In between, however, you have 60 percent that is neither pro-union nor pro-company, but just plain, every day pro-job; interested in taking the wares of the leader or the employer according as those wares appear likely to offer maximum satisfaction in their daily job. This indispensable 60 percent group is lacking unless on the minds of those 60 percenters you have certain definite grievances. These grievances in any large number, on the part of any large proportion of the group, is, finally, impossible unless the employer has fallen down on his job of knowing the mind of his workers.

The importance of individual grievances may be typified by the story of a friend who was called on to settle a strike that had been going on for three weeks. "I never saw," he told me, "such an unhappy group as the five employees who sat down for our conference after throwing across the table a sheaf of papers with the statement, 'There, Mr. Vice-President, are 42 demands, and until every one of those 42 demands is met, not one single employee gets through the picket line alive.'

"I had been taught," he continued, "that labor troubles were big affairs, things that had lasted years and years, and I couldn't imagine how these could number 42. The answer soon came. 'Demand No. 1, is the case of John Slovinski, who after 19 years of labor was laid off, his place being filled by Jim Smith, who happens to be the nephew of the boss' wife.' No. 2 was for Mary Strong. No. 3 was for Bill Semkens. Believe it or not, out of those 42 demands 38 had to do with no issue more

complex, more historic, more class-wide than the feeling that injustice had been done by the management to Bill and Mary and Steve and Charley, all the way down, every one a single individual. And after some hours we got them all straightened out. But the other four demanded representation of the Board of Directors—outrageous changes requiring weeks and weeks of discussion. But just then the chairman got up and

said, "Well, I have been talking it over with the boys and now that we got all those 38 cases fixed up we say, 'To hell with the other four!'"

So it is important to find out what kind of chestnuts your typical workers would like to have somebody pull out of the fire. What kind of chestnuts are they likely to be? Well, it seems to me that you can say this: that the key to the mind of the worker today is the personal, individual experience of that worker yesterday. If you want to know what is on the mind of your worker now, just look at what he

has been going through. What has been their experience? What have they been thinking about just recently? The thing on their mind will represent an attempt to adjust themselves to that particular difficulty. It takes no imagination to know that that particular difficulty with the American worker has been the recent experience of depression of hard times.

Fear of Job Loss

If you bear in mind the worries, the stresses and the strains that afflicted every family in the country during the past few years, you don't have to have much imagination to know what that experience of yesterday has put into the worker's mind today. It is spelled with four letters: f-e-a-r—fear! Most of all, the fear of losing their job; the job that erects the slender wall between prosperity on the one hand and the deepest misery on the other. The fear of the misery of joblessness, the wish for security has been put into place No. 1 in the minds of workers throughout the country as the result of the last few years of experience. As such it has caused around 90 percent of all the cases before the National Labor Relations Board within the past few years.

Yet every one has a right to say, "But why should losing the job be such a miserable thing, when you can go down to the relief organization and get something to eat?" I have had difficulty in explaining to my friends how I shall never forget the misery of going from gate to gate. Even though I could wire home and get needed funds, I often had to talk myself out of jumping in the lake! Why should the experience of job-

lessness be such a serious thing? It is because of a second and third thing that I have found on the mind of every worker everywhere: the wish to take pride in his job, and the hope that if he does his job at a low level of skill and responsibility then he will be chosen to move up to a higher level.

Pride in Work

Since time began there has never been anything invented that can be compared with a man's job for helping him to feel that he is a worth-while human being. Men everywhere are trying to find justification for themselves as persons, on the basis not of the wife they married, not of the house they live in, not of money in the bank, but of their job—the contribution to the lives of other men made by the performance of their particular job.

That is the reason—the spiritual reason, if you want to call it that—for the misery of having no job. That is the reason, also, that wherever I have gone I have found men praying, "Give us this day our daily job." This prayer for the daily job is not a prayer simply for the daily bread but for something in men's stomachs and also in their souls. It is another form of the prayer, "Establish thou the work of our hands; yea, the work of our hands establish thou it."

Difficulty of Making Industrial Unions Stand

Now this spiritual factor must be understood if one is to understand why, as the result of the experience of depression men throughout the country have been so willing to join a certain labor organization which has had one thing and one thing only to give, namely, protection—protection against being plunged into the misery of joblessness without proper justification; protection against favoritism. Hard times have been the chief cause of the tremendous growth of the CIO type union. It does give protection. It can be called a hard-time union because it can't sell itself except to men who have had an experience which creates tremendous value of protection. But if you have men experiencing good times, then they want not simply protection, not simply security, but a larger satisfaction of their pride; fulfillment of their hope to work up to the higher differentials. At such a time, the CIO organization has to say, "We don't believe in those differentials." So the weakness of the CIO is that, while it is well fitted to give them protection, it fails to give them what they want to have in better times.

One night in Chicago's "Bughouse Square" an I. W. W. soap-boxer got up and said, "Don't you guys realize that if we as wage earners join one big union and get the protection of one big hat, we can tell all the rest of the United States where to head in? Why don't you get wise to yourselves and join the one big union?"



Whiting Williams

Well, why not? Why haven't they done that years ago? The answer was given me by a locomotive driver when he called across his cab, "Did you see that guy shaking his fist at me? He's a trackwalker, on strike, and he's shaking his fist at me because we engineers voted not to join their strike. But that guy forgets that he can walk off his unskilled job any time he likes and get a job as good as he has. But we engineers have got to keep our particular kind of job, so we have to work out a different way of getting along with the boss. He's crazy if he thinks we are ever going to join up with his rough-neck union and be bossed by his rough-neck majority."

Always in the worker group there is the factor of job status. No engineer would ever be willing to be bossed by a trackwalker. Time after time it has happened in this country that during hard times the men enjoying differentials joined hands with the bottom workers. But time after time, when good times came around and demand revived for these men, that centrifugal force revived and the skilled men broke away from the unskilled.

All that I am saying means that these agreements that have been achieved by the CIO and the United States Steel, automobiles, etc., do not represent anything like the degree of permanent unionization that the country as a whole has assumed. On the contrary, they represent the writing out of an order for the delivery of a certain amount of service in terms of increased satisfactions on the job for the benefit of the 60 percenters, the men who are finally to decide whether the actual delivery of that service as promised by the organization in competition with the employer is worth its cost in dues. The outcome

will depend most of all upon the attitude of 60 percenters who are reasonable, long-headed—also hard-boiled, quite prone to say, "Yes, we got certain gains last month and we paid for them with our dues. But we won't pay any more until we get some more gains."

I believe that the CIO-type union can't be made permanently to exist in the new mass-production industries unless it has the help of the closed shop and the checkoff. I also believe that the inexperience of the CIO leaders in automobiles, rubber, etc., is so great that they cannot secure the cooperation of their own members in obtaining the checkoff.

Fear, Hope, Pride Rule Worker's Mind

All this means that the worker's mind is concerned with three things: Fear, hope, pride—and the greatest of these is pride. It is because of pride that workers everywhere are exactly like you and me in wanting to live and move and have their being in their work. Now if it is true that the worker wants to live and move and have his being in his job, then you have an enormously better opportunity to sell him your stuff, if it is straight goods, than any outsider. So I want to leave with you a summing up of what I have said in the one word—"contact."

Over in Europe I once got a job in what was called the "hot spot of Europe," the valley of Germany's Saar. There French engineers were bossing German coal miners. I found in the hot spot everything going along very well; the Germans liked their French bosses. How come? Because French engineers in the mining schools of France are taught that 80 percent of every ton of coal depends upon the successful operation of a machine which begins with the tip of the man's finger and ends with the top of a man's head.

So they are taught always that that machine is too complicated a piece of machinery to be left entirely to the supervision of the foreman. As a result, in every mine, everywhere, you find the French engineer-executive spending two hours of every day down under the ground. So as we dug coal along would come the big shots, the two most distinguished engineers of France. They would inquire, "Are they giving you good tools? How about air? Are they pumping out the water? Let us know if the others do not give you what you want, because we are here to help you." Finally, with much bowing, they would go, and these Germans would exclaim: "For the love of God, what do you think of that? Here we have been taught from the kindergarten up to hate every Frenchman, and yet in all our 30 years of working we never saw a German engineer of the level come down here to talk with us like that!"

No system, no method, no plan, no warfare, no national labor relations board, no friction.

After all, the relationships between you and Tom Jones, laborer, aren't so different from the relations with your wife. Both relationships are based on contact leading to mutual understanding and mutual respect.

Contact, understanding, mutual respect, fairness, honesty. We have got entirely too far away from these things. While today we are thinking that we should have Government take care of things, we are going to find shortly that while laws may be necessary, there is, nevertheless, no substitute in all the world for cooperation. If I can add one other word to contact, understanding, cooperation, fairness, honesty, I will take the liberty of adding appreciation, a kindly word.

Mineral Land Withdrawals

(Continued from page 31)

construction of drainage tunnels. Not only would this aid in the solution of the unemployment problem, but would add materially to the national wealth by making available rich known deposits. Certainly, in view of the vast governmental expenditures for relief, for agriculture, and for public improvements, the mere item of cost in such proposals cannot be considered prohibitive. Nevertheless, it is particularly true that in such proposals conservation should be regarded as an engineering problem and not as a political slogan.

Some economists have classified metals into four main groups—those of which

we have an exportable surplus, those of which we have a supply reasonably adequate for our needs, those of which deposits are so small or poor that they cannot be worked in competition with foreign countries, and those, fortunately few in number, which are practically nonexistent, and which we must import. Some of these, notably manganese, are strategically necessary for waging war. Others, such as petroleum, of which we have an apparently adequate supply, but which are vitally necessary to national defense, consumable in nature, must, of course, be conserved to meet any possible national emergency. No one can reasonably challenge withdrawals based upon these considerations. Such strategic metals and mineral fuels are now so essential in modern industry and war

that no nation can expect to remain a first-class power unless it is well supplied with them, either at home, by its allies, or from its colonies. Italy and Japan have apparently realized this, as evidenced by their efforts in Ethiopia and northern China. However, few would assert that the efficient use of durable metals as the basis of industry and commerce, and thus available in case of war, is wasteful. Certainly the Nation is quite as safe with such metals produced and above the ground, and thus available for immediate use, as it is with them locked as in a treasure chest under the surface of the earth.

There is profound wisdom in Emerson's comment that true economy consists not in saving the coal but in using the time while the coal burns.

Preparation of 'Bee-Veer' Coal

(Continued from page 13)

Due to the excessive percentage of fire clay in the raw feed, the recirculating wash water is badly polluted and the spraying requirement greatly exceeds the make-up water actually required to keep up the circulation. This water is pumped from the East Fork Sharon River, approximately 6,500 ft. from the plant. In addition to the spray headers, the fresh-water piping circuit connects into the sludge system, as previously described; delivers clean sealing water to the packing glands of the recirculating pumps; furnishes the necessary water for the heating plant, the laboratory, and the drip trough of the refuse belt; and also delivers optionally into the pump sumps for rapid refilling of the system after a drainout.

Drainout valves are provided in the bottoms of the four refuse wells of the washers, with enclosed drainout launders leading to the sewer. The inclined refuse belt is provided with a drip trough throughout its length, with a flushing water connection at the high end, and delivering from its low end into a spout which leads to the sewer. A cross trough, just beneath the cut-off gate of the refuse bin, receives the bin drip when the gate is closed and diverts it to a drain ditch beside the refuse road, to avoid the formation of mud and ice in the road.

Plant Heating System

The plant is heated by unit heaters, using low-pressure steam. Ten units are located at various points throughout the plant, so arranged as to establish a definite convection circuit of heated air and deliver the required amount of heat to all portions of the building. These heaters, as well as those in the near-by garage and other mine buildings, are served by a 175-hp. No. 15 boiler, with Dutch Oven setting and underfeed stoker. Washed $\frac{3}{4}$ -in. slack is used as fuel. Positive condensate return is effected by means of a condensate pump and tank with float-controlled automatic operation. Necessary make-up water for the heating circuit is received directly from the fresh-water piping circuit.

All motors are controlled by remote control by push buttons. The coal washers, with their direct auxiliaries, have a separate control desk located at one end of the inspection walk between the washers. All the rest of the plant is controlled from the main control booth. It is so located that the loading points are in view of the control man, who operates the car retarders and boom hoists, as well as controlling the operation of the entire plant. A signal system between the control booth and the washer control desk assures proper timing at starting and stopping. An emergency master switch makes it possible for a single push button to shut down the entire plant, with the exception of the dewatering screens and recirculating pumps.

The sudden stoppage of these units may result in an overflow of water, but they may, of course, be stopped immediately by their individual push buttons when it is necessary.

The entire preparation plant was designed and erected by the McNally-Pittsburg Manufacturing Corporation, of Pittsburg, Kans.

During the summer of 1937 there was added to the tipple complete hot-vapor coal-treating equipment, by means of which any or all sizes of the coal can be oil-treated. In order to permit of treatment with oil of any viscosity, from the lightest to the heaviest, Viking Manufacturing Company equipment with circulating hot-oil lines was installed. The oil is pumped from a buried tank through electric heating units to the sprays located at the loading booms. The oil is kept at the proper temperature right up to the nozzles by companion lines, paralleling the main oil lines, through which hot oil is circulated continuously. Each set of sprays is individually controlled by a solenoid valve, actuated by a push button by the control man.

The finished product of the plant is marketed under the trade name "Bee-Veer," through the Kansas City sales offices of the operating company, in charge of Mr. F. R. Hayde, district manager. The general offices of the Binkley interests are in Chicago, and the officers include: Mr. H. E. Howard, president; Mr. C. F. Hamilton, vice president in charge of operations; Mr. W. G. Gregory, vice president in charge of sales; and Mr. B. H. Schull, general manager. Mr. E. S. Mayor is the superintendent in charge of the operation.

Federal Finance and Taxation

(Continued from page 27)

materially at a time when it was needed most.

For instance, there is the case of a certain well-known producer of capital goods. Because of the fluctuations in that industry, the company adopted a policy of retaining about 30 percent of its earnings during prosperous periods as a reserve to stabilize its operations, employment and dividend policy during depressions. For the seven years, 1929-1935, the company had a total net income of \$6.7 millions and paid out over that period a total in dividends of \$6.9 millions. Had it concentrated the dividend distributions in the good years of 1929, 1930, and 1931, the company would have been forced to curtail its activities, lay off workers and eliminate entirely any dividends during the bad years of 1932, 1933, and 1934.

Yet, this is precisely the effect the undistributed profits tax will have on business in the next business recession. Furthermore, by compelling the payment of dividends in good years, the tax artificially stimulates boom periods and ac-

centuates the downward spiral in times of depression.

Conclusion

The ten defects which I have enumerated are by no means a comprehensive list of the difficulties which have been suddenly presented by this revolutionary method of taxing business. I have also forbore to discuss certain defenses of the tax which have been advanced from time to time, suggesting that its rigors can be avoided by such devices as stock dividends, scrip, stock rights and the issuance of new stock to acquire additional capital. I regard most of these devices as impracticable for the average corporation. Even where they can be used successfully, they are mere palliatives, effective only for short periods of time.

I repeat that the undistributed profits tax should never have been enacted, and should be promptly repealed. If not repealed, then certainly appropriate amendments to remedy its proved defects should be enacted at the next session of Congress.

Hanna Iron Ore Declines to Sign CIO Contract

The Hanna Iron Ore Company of the Mesabi Range, Minnesota, recently declined to sign a proposed labor contract submitted by the CIO. In connection with this refusal, the company addressed a letter to the employees stating that "We are always glad to discuss our mutual problems with you and will do anything we consistently can to improve conditions in our business. If at any time there is anything you want to talk over with us, you know our door is always open to you or to any representative you want to select."

New Anthracite Breaker Leased by Coal Company

Preparation of anthracite mined at various shafts of No. 9 colliery at Pittston, Pa., now operated by the Sullivan Trail and Pittston-Anthracite Coal Company, will be transferred from the Barnum breaker at Duryea to No. 1 breaker at Dupont.

Louis Pagnotti, company president, said he is completing a lease for No. 1 breaker, owned by the Pittston Company, because the Barnum breaker has been inadequate for the preparation of anthracite mined at various shafts of No. 9 colliery, taken over by his concern last June.

When No. 9 colliery was reopened by Pagnotti's company, approximately 1,000 men were given employment. The Barnum breaker was first taken over for the preparation of fresh-mined coal but the arrangement was unsatisfactory.

No. 1 breaker, a more modern plant, will be able to handle the output shipped from No. 9 colliery openings.

News and Views

of Interest to Mining Men

California to Have Another Huge Gold Dredge

The second largest gold dredge in California is to be put in commission in the Folsom field by about December 1 by the Capitol Dredging Company. Constructed at a cost of about \$750,000, the giant dredge is 430 ft. long and is equipped with 100 buckets, each having a capacity of 18 cu. ft. It will operate to a depth of 77 ft. below the water line. Included in the machinery is a pump for cleaning mud from the bottom of the pond.

Nearby, the Natomas Dredging Company is completing its No. 8 dredge at a cost of \$500,000. Its digging depth will be 67 ft. below water level, and it is designed to handle 350,000 cu. yd. of gravel per month. Constructed entirely of steel, the hull weighs about 2,000 tons. It will be placed in operation some time during December.

Washington Mining Institute to Meet in Seattle in January

The Eleventh Annual Mining Institute sponsored by the College of Mines, University of Washington, Seattle, will be held during the week of January 17-22, 1938. Meetings are scheduled at the Mines Laboratory on the University Campus each day except Saturday, when a field trip will be taken to some point of mining or metallurgical interest. Lectures and laboratory demonstrations on problems dealing with mining, metallurgy, ceramics, and related fields will be given by members of the staff of the College of Mines. In addition, prominent operators and engineers in the industry will present subjects dealing directly with operation; leading manufacturers will display and demonstrate new equipment and machinery; and motion pictures illustrating current operations will be shown.

More detailed information will be available at a later date. Requests for preliminary information should be addressed to Milnor Roberts, dean, College of Mines, Seattle, Wash. Attendance at the meeting in 1937 was 284.

New Blast Furnace Placed in Operation

American Rolling Mill Company has placed in operation its new blast furnace at the Hamilton Coke and Iron Company property, the first new furnace to go into operation in the country since 1928. The new furnace has a daily capacity of 500 tons, and will be used for manufacture of merchant pig iron, demand for which has increased rapidly this year.

Total blast furnace capacity of Hamilton Coke and Iron is now 1,200 tons daily, recent modernization of their No. 1 furnace having increased its capacity to 700 tons daily.

Continued Increase in Colorado Mining

A prediction that metal mining in Colorado will be \$3,000,000 more this year than last was made late in October by John T. Joyce, State Mine Commissioner. His prediction, however, was made on the supposition that the gain this year will be the same as that of 1936 over 1935, when 14 percent more metal was mined. On that basis, the 1937 total will be \$22,600,000.

"We look for an increase both in the volume of ores and the number of men employed," Joyce said. In 1936, 15,500 mining men were working in the industry in the State. There will probably be a slight increase in this figure this year.

He explained that Colorado formerly produced a great deal of zinc, but that its production has fallen to a point where last year this branch of mining produced only \$117,200. The annual average zinc production has dropped from 73,000,000 lb. to a little over 2,000,000 lb. within the last few years.

Copper Company Suspends Operations

Operations of the Walker Mining Company in Plumas County, Calif., employing about 500 men, were suspended early in November, according to a company announcement. It was said that it was not known when the mine would be reopened, but that it would depend upon the future of copper prices.

Hosford to Stay With Bituminous Coal Commission

Following a recent conference at the White House with Secretary James Roosevelt, Charles F. Hosford, Jr., withdrew his resignation and will remain indefinitely as chairman of the National Bituminous Coal Commission.

About a week previous Hosford had turned in his resignation, effective about January 1, because he could not afford to remain in the Government service, denying that friction within the Commission had prompted his decision.

The President later on went over difficulties with the entire membership of seven commissioners, and at a recent press conference expressed hope that Hosford would reconsider his resignation.

In withdrawing his resignation, Hosford said that he would continue "to

work with the other commissioners in making minimum prices effective at the earliest possible moment."

Final Dissolution of United Verde Extension

A special meeting of the stockholders of the United Verde Extension Mining Company has been called for the purpose of approving a plan of liquidating and dissolving this famous copper producing enterprise. The meeting is called for November 29 at the company's office in New York.

Decision to recommend such action was arrived at by the Board of Directors at a special meeting held on November 1, 1937. This action was necessitated by the fact that the once famous ore bodies of this company are now practically exhausted, and that no future profitable ore bodies have been overlooked because of the exhaustive development work persistently carried on during the years of production.

Liquidation will be accomplished by "judiciously disposing of marketable securities and paying dividends in liquidation, as cash in the treasury may be available. The sale of the physical properties of the company will take some time, but will be handled by the management with as little delay as reasonably possible, but the liquidation will be finally completed and finished before December 31, 1939," according to the statement by J. F. Douglas, president.

The first liquidating dividend of \$2 per share will be made on or before December 20, 1937. After this distribution, there will remain in the treasury intact about \$500,000 and about twice that amount in marketable securities based on market prices as of November 1.

Since the organization of the company in 1916 United Verde has paid out \$47,801,250 in dividends, or \$45.52 per share.

Zinc Stocks Show Increase in October

Total stocks of zinc held by smelters increased during October by 12,300 tons, while stocks of prime western grade increased by 5,100 tons. These increases were brought about principally by a general decline in shipments. Deliveries were 7,400 tons less in October than in September for all grades, and 1,150 tons less for prime western.

Production of domestic zinc amounted to 52,645 tons in October, which was 2,618 tons more than in September. Production of prime western increased from 27,412 tons in September, to 28,667 tons in October.

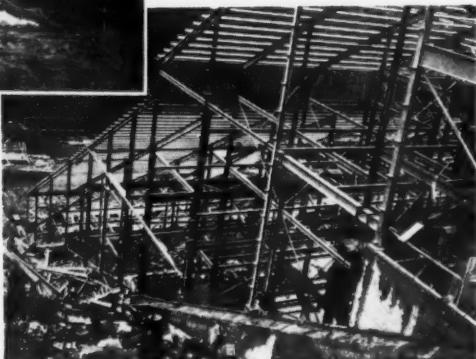
Unfilled orders were down to 75,000 tons on October 31, compared with 92,300 tons at the end of September, and the record high of 106,200 tons on August 31.



Construction Progresses at Howe Sound

Howe Sound Company is making rapid progress in the construction of its plant at the Holden, or Chelan, copper mine, high in the Cascades above Lake Chelan, Wash., and expects to be in operation by next April. The company is expending \$2,500,000 in this construction, which includes a 1,000-ton mill—the largest ever built in the State of Washington. The framework of the mill, bunk houses, and other buildings is of steel. The four large bunk houses are ultra modern, each to accommodate 50 to 75 men; the bunk houses will be heated by oil burners and steam. Each room will be occupied by two men, and in each house there will be a clubroom, library, billiard and pool tables, and baths.

This mine is understood to carry 1½ percent copper, \$2 in gold and some silver. The ore deposit is reputed to be 100 ft. wide and is said to have been opened nearly 1,000 ft. The mine has been almost inaccessible, located at the foot of glaciers at an elevation of more than 5,000 ft. The company has put in its own barge line on Chelan Lake and has built an excellent road from the lake to the mine. Washington Water Power Company, of Spokane, is building a 52-mile power line of 110,000 volts. The cost of the line, exclusive of substations, will be \$275,000.



More Development and Less Production Scheduled at Mountain City Copper

Work at the Rio Tinto mine of the Mountain City Copper Company, Elko County, Nev., is being swung away from production to some extent and onto development projects on the property pending settlement of the present unfavorable condition of the copper market, according to a recent report by Al Lofquist, superintendent of the mine.

Some of the crews now engaged in mining the rich copper ore will be transferred to development work both in the main workings tributary to the big Rio Tinto shaft, and on other sections of the company's large holdings.

Recent lay-offs at the mine have been in building crews which are rapidly finishing the summer's building program which has resulted in construction of

new apartment living quarters for many of the employees and also in construction of a new high school.

October Receipts of Iron Ore At Lake Erie Ports Decline

Receipts of iron ore at Lake Erie ports during October amounted to 4,887,800 tons, compared with 5,387,889 tons in the same month in 1936, according to the Lake Superior Iron Ore Association.

Receipts for the season through October amounted to 42,474,515 tons, compared with 28,297,787 tons during the similar period in 1936. Shipments from docks to interior furnaces during October were 2,803,224 tons, compared with 3,611,937 a year ago, and for the season 29,778,470 tons, compared with 21,560,700 tons in 1936.

Ore on Lake Erie docks on November 1 amounted to 6,056,572 tons, a gain of about 40 percent over the amount for the same date of 1936. It is expected that by December 1 Lake Erie stocks will exceed the record high of 6,489,612 tons set at the close of the 1929 season.

Improvement Program at Golden Cycle Mill Almost Completed

The two-year improvement program at Golden Cycle mill, Colorado Springs, Colo., is nearing completion with installation of new crushers, the construction of a new coaling system and other work. It is expected that all improvements will have been completed by December.

The crushers are 4-ft. Symons cone crushers, made by the Nordberg Company, Milwaukee, Wis. The sampler is to be further enlarged, greatly increasing its efficiency.

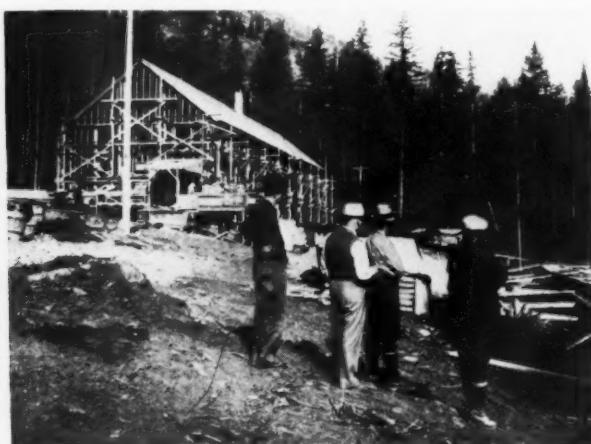
A large concrete coal bin now under construction will have a capacity of 300 tons of coal. When this is completed, coal will be crushed at the mine and brought to the mill as slack. About 90 tons of coal is burned at the mill per day.

Installation of this new machinery and the construction of new buildings has furnished considerable work in the last two years, the force of men engaged in making these improvements having ranged from 20 to 30 during that time.

Island Creek Moves General Offices To Huntington

James D. Francis, president of Island Creek Coal Sales Company, recently announced that the general sales offices of that company were moved from Cincinnati, Ohio, to Huntington, W. Va., as of November 1, 1937.

H. A. Glover, assistant to the president, in charge of sales, and his staff, as well as the sales accounting, distribution and general sales staffs of the Sales Company, will be located in Huntington; and all sales and distribution through the company's various offices at Cincinnati, Detroit, Cleveland, Richmond,



Howe Sound Company Bunk House.

Chicago, New York, Boston and Toronto will be directed from Huntington, W. Va.

The Island Creek Coal Company and its subsidiaries have taken over the entire sixth and seventh floors in the Robson-Prichard Building in Huntington.

By locating its general sales offices in Huntington, the Island Creek Coal Sales Company will have its president, assistant to the president, general sales and sales promotion staff, the engineering, distributing and sales accounting departments all in the same city and building for the first time in its history. By bringing the mines, sales and management closer together, the Island Creek Coal Company expects to be able to do a more efficient job of selling and serving its customers. Close proximity to the mines will be of value both to the sales and production departments.

Mr. Francis advises that this does not mean any change in the company's sales office at Cincinnati. L. C. Percival, manager of sales of the Cincinnati Division, will continue in charge of that division, with offices in the Dixie Terminal Building now occupied by the company, and all salesmen attached to the Cincinnati Division will make their headquarters in the Cincinnati office.

The Island Creek Coal Sales Company sells the entire production of the mines owned by the Island Creek Coal Company, located at Holden, Logan County, W. Va., and the mines of the Pond Creek Pocahontas Company at Bartley, McDowell County, W. Va.

The producing companies own approximately 50,000 acres of coal lands containing approximately 250,000,000 tons of unmined coal in Logan, Mingo, and McDowell Counties, in southern West Virginia. They operate 23 mines with an annual capacity of 10,000,000 tons, and this year will produce about 7,000,000 tons of coal, which places them among the largest producers of coal in the United States.

The office of the chairman of the Board of Directors, T. B. Davis, and his staff, and A. R. Davidson, manager of sales, New York Division, will continue at the present location, 20 Exchange Place, New York City.

The general corporate offices of the company, M. L. Brennan, secretary-treasurer, and staff; the board rooms for meetings of the Executive Committee and Boards of Directors; and of J. R.

Evans, manager of sales, New England Division, are being moved from 1 State Street, where they have been for the past 11 years, to Suite 905 in the Second National Bank Building, 75 Federal Street, Boston, Mass.

Thunder Mountain Operating Steadily

Thunder Mountain Mining Company, financed in Spokane, Wash., has started the production of gold bullion at its property in the rugged mountain district of central Idaho, 95 miles beyond the town of Cascade, its nearest railroad point. A. H. Sperry, of Spokane, is president, and L. D. Berry is superintendent. In October the company's mill handled 337 tons, carrying \$9.83 per ton in gold. Costs for mining, milling and materials are under \$4 a ton. The plant is handling 40 tons of ore each 20 hours. Mr. Sperry reports 10,000 tons of this \$10 ore in one stope and 250,000 tons of ore blocked out that will average better

ounces of gold and 71 ounces of silver were sold for \$29,720, giving a profit of \$10,826 above production costs. From November 1, 1936, to September 30, 1937, sales of bullion and concentrates amounted to \$282,195, leaving a profit of \$89,595, which went into working capital. The property has been prepared for steady operations during the winter but further shipments of concentrates and bullion will be deferred until spring because of the difficulty of reaching the property in the winter.

New Shaft Completed by Hays-Manning And Happy Hollow in Tri-State

The Hays-Manning Mining Company has completed the sinking of a new shaft south of their new mill near Joplin, Mo.

The shaft has been put down to a depth of about 90 ft., and the drifts are being developed on runs of lead, zinc and silicate ores. When development has proceeded to a sufficient extent, the company plans to move a derrick, hopper and incline on the north side of the mill to the new development.

The Happy-Hollow Mining Company developing the Aylor land lying to the south of the property described above, also has completed the sinking of a new field shaft south of their new mill, which is 80 ft. deep. Dirt from the new shaft is dumped into a small hopper, thence into cans and moved over a lay-by to the mill derrick, where it is hoisted and dumped on a hopper platform in the mill.

Grindability of Alabama Coals

Grindability tests are being made by the Southern Experiment Station of the United States Bureau of Mines on samples of coal collected from most of

the important commercial mines in Alabama. During the past two or three years grindability tests have been run on a vast number of coal samples from various coal fields in this country, the purpose of these tests being to obtain information as to how easy or difficult various coals are to pulverize. Pulverized coal is being used extensively as fuel for steam-raising, cement kilns, and certain types of metallurgical furnaces, and the suitability of a coal for such use is affected considerably by its pulverizability.

The samples of Alabama coals tested

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Annual Meeting of American Mining Congress

As this issue goes to press, arrangements are being completed for the 40th Annual Meeting of the American Mining Congress, to be held at the Mayflower Hotel, Washington, D. C., December 1-3. A principal feature of this meeting will be the luncheon on Thursday, December 2, at which Honorable Wesley E. Disney, Congressman from Oklahoma, will speak on "Revision of the Revenue Laws," a subject of paramount importance to mining at this time, in view of the Treasury Department's recommendation for elimination of percentage depletion, and the harmful effects which are already plainly evident from the tax on undistributed earnings. Following this a business meeting of members will be held, at which reports of officers and committees will be made, followed by a full discussion of the activities and policies of the organization. In conjunction with this meeting various special conferences will be held by the Coal Operators' Committees of the American Mining Congress, which have made excellent progress in their studies of modern mining methods; by the Resolutions Committee, the Executive Tax Committee, and the Board of Governors of the Manufacturers Division. An extended program of formal papers will not be presented in view of the two large conventions and expositions held by the American Mining Congress during the year—for the coal mining industry at Cincinnati in May and the metal mining industry at Salt Lake City in September.

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than \$8 per ton. He expects operations to continue throughout the winter, in spite of a high elevation.

Azurite Gold Production

Azurite Gold Company, which is being operated by the American Smelting and Refining Company in southeastern Whatcom County, Wash., had a production in September of 1,096 ounces of gold and 24 ounces of silver from 2,455 tons of ore mined and milled. In September, 862

show a wide variety of grindabilities and they also show the general relationship between volatile content and grindability which has been noted in other coal fields throughout the country. The samples show grindabilities varying from 96 percent for the samples most easily pulverized to 45 percent for the ones that are the most difficult to pulverize. A bituminous coal which pulverizes readily would have a rating of approximately 100 percent while one which pulverizes with difficulty might be rated at about 40 percent. The wide variation in grindability of Alabama coals is accompanied by a variation in volatile content from approximately 26 percent to approximately 40 percent, the most difficult coals to pulverize being the ones with the highest volatile content and vice versa.

New York Iron Mine Leased by Republic Steel

The Republic Steel Corporation has assumed control of properties of the Witherbee Sherman Corporation, pending approval of a 25-year lease by Witherbee Sherman stockholders, according to a recent announcement. The lease includes operating iron ore mines, concentrating plant and the sintering plant at Mineville and Port Henry, N. Y., and about 100,000 acres of iron ore bearing lands near Lake Champlain in Clinton and Essex Counties, N. Y.

The terms of the lease require Republic to mine a minimum of 500,000 tons of iron ore annually, according to R. J. Wysor, president of Republic.

Meeting of Northwest Mining Association at Spokane

Trustees of the Northwest Mining Association recently fixed Friday and Saturday, December 3 and 4, as the dates for the annual mining convention in Spokane. Bliss Moore, president of the association, has appointed the following committee to make arrangements: J. W. Turner, R. Marsh and Storey Buck, finance; R. Oscarson, A. R. Kolmetz and A. W. Buisman, program; C. R. Bennets, Clare Gray, H. R. Buisman, and C. O. Ferquist, ore exhibits; Storey Buck, J. R. Brown, and R. Clarke, entertainment.

New Anthracite Agreement Announced

Setting a precedent in contractual relations between anthracite operators and the United Mine Workers of America, an agreement was reached November 15 extending the current hard coal contract for another year, thus insuring an uninterrupted supply of anthracite and peaceful conditions in that producing area until April 30, 1939.

The official pronouncement came from John J. Boyland, secretary of the Anthracite Conciliation Board and former president of District 1, United Mine

Workers of America. A brief introduction was followed by the five paragraph text of the extension agreement, the most vital clause in which was as follows:

"Now, therefore, the parties hereto do covenant and agree again each with the other that the provisions of said agreement of May 7, 1936, including rulings and decisions of the Board of Conciliation made subsequent to that date, shall continue in force and effect to and including April 30, 1939."

The renewed contract will differ only in minor details from the two-year agreement under which the industry now operates. The only deviation was the agreement that it will incorporate as part of a contract, the rulings of a conciliation board and its new umpire, Thomas Larkin, which went on record subsequent to May 7, 1936. It will continue for another year the seven-hour work day and five-day work week, the concession which was won by the union in the writing of the 1936 agreement.

It will likewise continue in force the operators' privilege of working more than a five-day week during periods of heavy market demand. Such an extension of the working day is allowable for 12 weeks during a single year.

Existing wage rates are retained in the extended contract, including the clause requiring payment of the same daily wage rate for seven hours' work as was previously paid for the eight-hour shift.

The one-year extension now places the anthracite and bituminous industries on the same contractual footing, for the first time since 1922. Under the new set-up the anthracite agreements will expire in 1939 on the same date as does the soft coal industry's contract.

The agreement was reached following a meeting of a committee of 12, representing anthracite operators and United Mine Workers of America, in the Engineering Society's Building, New York City, on November 12 and 13. At this meeting a tentative agreement extended the provisions of the present contract to April 30, 1939.

The members of the committee were: Representing operators, W. W. Inglis, chairman; J. B. Warriner, R. E. Taggart, L. L. White, N. D. Stevens and J. H. Pierce; representing United Mine Workers of America, John L. Lewis, Philip Murray, Thomas Kennedy, Michael J. Kosik, Mart F. Brennan and Hugh V. Brown.

The proposed agreement was later accepted by the anthracite coal operators at a general conference in New York City on November 15.

Ratification or rejection of the one-year extension will be called for without delay by the miners' union, but since the extension agreement has already been passed upon by John L. Lewis, his associate officers and the tridistrict executive board, reports indicate that almost unanimous ratification by the union membership can be expected.

In addition to the contract extension, the joint conference resulted in agreement on the appointment of a committee of producers and union representatives to meet with the Pennsylvania State Secretary of Labor and Industry to work out a plan for compensation payment to injured mine workers.

Charles F. Huber of Wilkes-Barre, head of the anthracite industry and chairman of the board of the Glen Alden Coal Company, has been named by the joint conference to select a committee to discuss the situation with Labor Secretary Bashore.

Coal Producing and Consuming Engineers Hold Joint Conference

Meeting jointly for the first time in an attempt to develop a better understanding of the interlocking problems of the coal producers and the coal consumers, members of the Coal Division of the American Institute of Mining and Metallurgical Engineers, and of the Fuel Division of the American Society of Mechanical Engineers, some 300 strong, met at the William Penn Hotel, Pittsburgh, Pa., October 27-29.

Technical sessions were held in the morning and afternoon of October 27 and 28, at which important problems dealing with coal preparation and utilization were presented and discussed by authoritative men in these fields. On Thursday afternoon a session of mine safety was also held.

At the banquet on Thursday evening, Charles F. Hosford, Jr., chairman of the National Bituminous Coal Commission, spoke on "Future Problems Involved in Governmental Regulation of the Coal Industry." After stressing the tremendous amount of coal that is wasted every year in the mining process, he went on to say, "At a time when competitive fuel industries were spending billions of dollars in studies of their products and possible markets, the coal industry's expenditures for that purpose were negligible.

"This failure to finance research work by engineers is partly responsible for the fact that the bituminous coal industry, if measured in terms of earnings, must be ranked as a perennial failure."

Turning to the new Bituminous Coal Act, he said that "it is by no means perfect and we will no doubt make many grave mistakes in administering it." But he continued that only through trial and error will the industry learn whether it can adapt itself to price regulation.

Toastmaster at the banquet was Alex Bailey, vice president, Commonwealth Edison Company, and also vice president, A. S. M. E.

On Friday, many of those in attendance took advantage of the inspection trips that had been arranged. These included a visit to the Champion No. 1 plant of the Pittsburgh Coal Company, and the Colfax Power Station of the Duquesne Light Company.

Operating and Retailing Problems Discussed at Annual Meeting of

ILLINOIS MINING INSTITUTE

REPRESENTATIVES of the bituminous coal mining industry of Illinois, 500 strong, met at the Hotel Abraham Lincoln, Springfield, Ill., on Friday, November 5, and participated in a program of value and interest to the industry under the leadership of their retiring president, W. J. Jenkins, who is also president of the Consolidated Coal Company, of St. Louis. The Institute chose as its officers for the coming year:

H. H. Taylor, Jr., operating vice president, Franklin County Coal Corporation, president; Paul Weir, consulting mining engineer, Chicago, vice president; B. E. Schonthal, reelected secretary-treasurer.

C. F. Herbert, of the Bituminous Casualty Corporation, Rock Island, Ill., presented the subject of "Mine Management's Responsibility in Safety." Mr. Herbert placed the responsibility for the safe conduct of mining operations squarely on the shoulders of the managing personnel of operating companies and insisted that the management must be thoroughly sold on the wisdom and necessity for the safe conduct of mining before progress can be expected from subordinates. He stated that it can now be taken for granted that everyone is sincere in the humanitarian desire to eliminate fatalities, injuries and suffering, and that it is now proper and pertinent to consider the actual money losses which result from mine accidents. He presented statistics showing that for every major injury there are 29 minor injuries as well as 300 no-injury accidents. Particular stress was laid on the hidden cost of accidents. The figure of 6.1c per ton was given as the cost of accidental injuries in the mines of Illinois and a total cost of approximately 30c per ton of coal produced was given as a cost which not only includes the injuries known and paid for, but also embodies the "hidden" costs which result from disorganization of personnel and operating conditions, including damage to mines and equipment. Mr. Herbert cited the example of a wrecked trip of cars in a mine in illustrating his discussion of hidden costs of accidents. In such a case there is not only the cost of the injuries sustained by the motorman and trip-rider and possibly others, but there is the restoration to service of the locomotive, the cars, the track, the timbering and the losses in production. Wrecked trips have frequently been known to have caused explosions with attendant costly catastrophes.

John W. Broadway, auditor for the Bell & Zoller Coal and Mining Company, made an interesting presentation of "Present Day Mining Accounting," and illustrated the changing methods which required an increasing flexibility in cost accounting systems. He brought into

the picture the new problems which have developed as the result of the Social Security Act and other legislation, and gave to the meeting a valuable outline of payroll methods now in use at large Illinois mining operations. Separate earning "card" for Social Security Workmen's Compensation and Federal and State Income Tax information was described, as well as the detailed procedure of the preparation of cost statements. The important problems of mine supplies accounting were described, and an example was given of the savings accomplished by the concentration of supply stocks under the supervision of a single warehouse organization. In summarizing, Mr. Broadway stressed the fact that accounting must keep pace with changing methods so that the facts of coal properties operation may be presented as required.



W. J. Jenkins
Retiring President



H. H. Taylor, Jr.
Newly Elected President

Mr. Broadway was told of the plan to embody in the Federal Revenue Act of 1938 a provision requiring the collection of the income tax at source on incomes of less than \$5,000. The plan contemplates that the employer shall simply deduct the exemption of \$1,200 (single men) or \$2,500 (married men) from the annual earnings and return the tax thereon at the rate of 4 percent to the Collector of Internal Revenue. If the recipient of wage or salary feels that he is entitled to additional deduction, he may file a return and request refund of the Internal Revenue agent. When asked if such a collection at source would greatly burden the accounting department of a mining company, Mr. Broadway indicated that while it would entail additional work, the burden would not be prohibitive.

Consulting Engineer James H. Fletcher, of Chicago, responsible for the rubber tired hauling of coal underground in place of the use of tracks or conveyors, presented a paper on "Modern Trend in Coal Mining." The absolute necessity for increasing the "tons per man day" was stressed as well as the importance of accomplishing this result with full safety protection to employees. Under the discussion of mine light-houses and planning, the co-subjects of multiple shifting and capital investment received attention. The economies made possible by modern ventilating practice, including modern fan design, were brought to the attention of the meeting. A new note was sounded when Mr. Fletcher called attention to the heavy power demands of a modern coal operation and prophesied that the future trend would be toward the construction of power plants at the individual coal mining properties. Of vital importance to the successful operation of coal mines in Illinois, was the call made by Mr. Fletcher for the necessity of breaking down coal at the face of the working places during the working shifts. The mines of Pennsylvania, Kentucky, West Virginia and other States have this privilege, and where the breaking of coal on the shift is prohibited it is a distinct handicap and a serious bar to progress.

The afternoon session was devoted to the presentation and discussion of the problems which arise in making the burning of coal and the furnishing of heat acceptable to the consuming public. Retailing services were described which are now contracting with the householders to furnish heat for a specified figure per year, without reference to the price of coal per ton.

At the dinner presided over by Vice President C. J. Sandoe, of the West Virginia Coal Company, the address was made by Vice President George W. Reed, of the Peabody Coal Company. Mr. Reed is chairman of the Bituminous Coal Producers Board for District No. 10, a three-man board, which functions for the coal producers of Illinois under the National Bituminous Coal Commission. The speaker presented "The Federal Regulation of the Bituminous Coal Industry," and described the labors of the board and the Commission in classifying coal and in endeavoring to arrive at a schedule of minimum prices. Stress was laid upon the fact that these are "minimum prices," and that coal may be sold at a reasonable figure in excess of the price finally fixed by the Commission. Mr. Reed spoke of the future of coal and of the need for research to develop additional uses. He referred to a most important phase of research in recommending that careful study be given to the use of pulverized bituminous coal in internal combustion engines. The potentialities of such a use are enormous and it is known that in endeavoring to find the answer to this problem, one internal combustion engine has been so operated in Germany for over 14 years.

Two Special 30-Ton Trucks Purchased

Two of the largest trucks in the world were recently purchased by the Sunlight Coal Company, Boonville, Ind. The trucks are specially built with a body capacity of 40 cu. yd., enabling them to haul 30 tons of coal each. Powered with motors of 175 h.p., they will be capable of a speed of 22 miles an hour loaded, with eight speeds in the gear system. Gasoline consumption will amount to one gal. per mile. Each truck weighs 23 tons, has 10 wheels, with four duo-tired driving wheels in the rear and 2 wheels in the front. The cost of each was \$16,140.

Molybdenum Development In Washington

The Deer Trail Monitor Mines Company recently completed a raise of 300 ft. from the tunnel level to the surface. It is said that the raise penetrated molybdenum ore, 14 to 18 ft. wide, through its entire length. A second raise will be driven 350 ft. south of the first, which will penetrate only 200 ft. of ground between the tunnel level and the surface. It is estimated that between these two raises and for 1,000 ft. beyond each way, there are approximately 200,000 tons of ore. This is sufficient to keep the mill, erected during the past year at a cost of \$27,000, and having a capacity of 22 tons per day, busy for more than 10 years. The company plans to add an intermediate crusher, thickener and regrinder to the mill, which will bring its capacity to 55 tons, and will raise the present grade of the product from 50 percent MoS_2 to 90 percent. Funds for these additions will be made available by an assessment. J. R. Brown is president of the company.

—Personals—

J. G. Bradley, president of the Elk River Coal and Lumber Company, was the principal speaker at a banquet given for all employees of the coal department of that company who had been in the company service for five or more years. It was held at Widen, W. Va., November 2.



J. G. Bradley

Mr. Bradley, as the oldest employee of the company in the point of service, received a gold service button. Similar buttons were given to other long service employees.

John J. Curzon is now with the Howe Sound Company as chief engineer of the Chelan Copper Mine, Holden, Wash. He was formerly superintendent of the Eureka Mining and Milling Company, Republic, Wash.

Hewitt Smith is now superintendent of the No. 6 Mine of the Kelleys Creek Colliery Company, Ward, W. Va.

E. E. Stephens has been named superintendent of the Ingram Mine of the Koppers Coal Company, Wriston, W. Va.

W. C. Thompson now holds the position of superintendent of the Cranberry Mine, New River Company, Cranberry, W. Va.

E. J. MacDonald, secretary-treasurer of Consolidated Coppermines Corporation, is making a trip to the Pacific coast, and will visit the Robinson and Warren copper mining districts en route.

James H. Pierce is head of four anthracite coal companies to be merged under the name of Temple Coal Company. The companies involved are the East Temple Corporation, East Bear Ridge Colliery, the Mt. Lookout Coal Company, and the Temple Coal Company. Employees now working in the four mines will not be affected by the projected merger.

F. S. Mulock was recently appointed general manager of western operations of the U. S. Smelting Refining and Min-

ing Company, at Salt Lake City. He succeeds **O. J. Egleston**, who was appointed vice president and consulting engineer of the company.

W. G. Gregory, vice president of the Binkley Coal Company, was in Fort Smith, Ark., late in October to attend the opening of the company's new office in that city. **Walter S. Stroud** is district manager.

H. F. Schuler has been appointed division manager of industries advertising of the Westinghouse Electric and Manufacturing Company, according to a recent announcement by **J. M. McKibbin**, sales promotion and advertising manager.

Mr. Schuler came to Westinghouse from the advertising agency of Ketchum, McLeod and Grove, Inc., where he was an account executive.

L. E. Grant has been appointed superintendent of the Eunice Mine of the Princess Dorothy Coal Company, Eunice, W. Va.

A. B. Rawn, Jr. was recently made superintendent of No. 9 Mine, Carbon Fuel Company, Wevaco, W. Va.



Erle P. Dudley

Erle P. Dudley, mining engineer, Kellogg, Idaho, is well known in the Northwest through the complete set of geological maps he has compiled of many sections of the United States and especially of the western mining districts. He has shown this collection at various meetings of service clubs and geological societies in the Northwest.

Ralph Utt has been appointed manager of a new office opened by the Denver Equipment Company, recently established in the Canard Building, San Francisco, Calif., to take care of their southwestern business.

George N. McLellan, formerly chief engineer, Coal Operators Casualty Company, Greensburg, Pa., has been appointed safety engineer of the Werton Coal Company and will be located at the Isabella mine, at Isabella, Pa.



John C. Cosgrove

John C. Cosgrove, of Johnstown, Pa., was reelected president of Bituminous Coal Research, Inc., at a meeting of the stockholders and directors held at Pittsburgh, October 7, 1937. Mr. Cosgrove assisted in the organization of the Research Corporation and during its existence over a period of several years, has filled the position of president. This organization is doing cooperative research work for the entire bituminous industry.

Dr. Paul D. Merica, director of research of the International Nickel Company and vice president of the International Nickel Company of Canada, has been awarded the 1938 John Fritz Gold Medal, highest of American engineering honors, for "important contributions to the development of alloys for industrial uses." The award is made annually for notable scientific or industrial achievement by a board composed of representatives of the four national engineering societies of civil, mining and metallurgical, mechanical, and electrical engineers.

D. Robert Yarnell, chief engineer of the Yarnall-Waring Company of Philadelphia and a national figure in organized engineering, has been elected president of United Engineering Trustees, joint agency of the four founder societies of civil, mining and metallurgical, mechanical, and electrical engineers. Mr. Yarnall succeeds **George L. Knight**, vice president of the Brooklyn-Edison Company.

H. M. Hartmann is now manager of the Mountain City Copper Company, Rio Tinto, Nev.

John Groff, mining and metallurgical engineer, was recently retired from service with the Bureau of Mines, U. S. Department of the Interior, because of physical disability. The retirement of Mr. Groff follows more than 45 years of professional and scientific activities in the course of which experience he pioneered in many fields.

Following some 20 years of broad experience throughout western states and Central America and Mexico on problems pertaining to ore concentration and cyanidation, Mr. Groff joined the staff of the Bureau of Mines at Fairbanks, Alaska, in 1917. Some of his outstanding accomplishments include: The establishment of the validity of Rittinger's law of grinding; demonstration that precious metals could be precipitated by charcoal and recovered by flotation; the development of explosion and nozzle crushing; and the demonstration that sulphur dioxide and other deleterious substances can be removed from smelter fume as a valuable by-product, through the action of ammonia and steam.

Mr. Groff is the author of many articles relating to these subjects, and to the metallurgy of gold and silver, which have appeared in principal journals or U. S. Bureau of Mines papers. His comprehensive bulletin on crushing and grinding of ores is to be published shortly by the Bureau of Mines.



H. F. McFarland

H. F. McFarland, mining engineer, formerly employed by the Cerro de Pasco Copper Corporation of Morococha, Peru, South America, sailed October 26 for Cape Town where he has accepted a position with the West Rand Consolidated Mines, Ltd.

Among the visitors to the offices of the American Mining Congress during November were: **Horace Albright**, U. S. Potash Company; **Emil Richter**, Howe Sound Company; **W. E. E. Koeppler**, secretary, Pocahontas Coal Operators Association; **H. Peterson**, Hercules Powder Company, Salt Lake City; and **C. E. Lawall**, director, School of Mines, West Virginia University.

Earl Weimer, formerly superintendent of Mine No. 11, Hanna Coal Company, Dun Glen, Ohio, has been appointed assistant general superintendent of the

Koppers Coal Company, at Grant Town, W. Va.

* **Edgar Blackwell** has been appointed superintendent of the Summerlee mine of the New River Company, Summerlee, W. Va.

D. E. Tabor has been appointed superintendent of the Bottom Creek mine of the Pocahontas Corporation, Vivian, W. Va.

—Obituaries—

David Brown, president of the Rocky Mountain Coal Mining Institute and general superintendent of the Spring Canyon Coal Company, and the Royal Coal Company of Utah, died from a heart attack on October 31 at Spring Canyon, Utah.

James F. Place, vice president of the Hudson Smelting and Refining Company, Newark, N. J., died October 9 from injuries suffered when he was struck by an auto a few days earlier. His age was 49.

I. H. Barbee, manager of the Atlanta plant of the Link-Belt Company, died in a Philadelphia hospital November 4. Mr. Barbee had a wide engineering experience, and had served Link-Belt Company at its Chicago, Philadelphia and Atlanta plants a total of about 25 years.

Frank E. Learned, vice president in charge of operations of the Philadelphia and Reading Coal and Iron Company, died of a heart ailment at his home in Marion, Pa., at the age of 57, following an illness of about a month.

He was associated for some years with Stone and Webster, Inc., as construction superintendent and appraisal manager. For the last 10 years he had been with the Philadelphia and Reading Coal and Iron Company, first as assistant to the president and later as vice president.

Louis I. Coggesshall, who for the last 22 years had been employed by the National Lead Company, died September 16 after a brief illness at his home in Lyndhurst, N. J. He was 58 years old. In late years Mr. Coggesshall had acted as assistant to Mr. A. B. Hall, in the metal department of the National Lead Company.

Edward G. Lewis, president of the Shady Lane Coal Company, Seelyeville, Ind., died suddenly at Seelyeville, Ind., September 21, at the age of 65. Death was due to heart trouble. During his many years in coal mining he had served as superintendent of the Chicago-Sandoval Coal Company at Sandoval, Franklin County Coal Company at their mines in southern Illinois and at one time was superintendent at Groveland Coal Mining Company, Mine No. 2 in East Peoria.

These Bethlehem Products speed the pace of mining

Trackmen lay rails up to the face for the cutters; remove a length or two for blasting; put them back in place as the mechanical loader moves forward. No time lost here when rails are laid on Bethlehem Steel Ties. The rail is set in place, the clip knocked home, and track is laid, accurately to gage, firmly held by the clips. Nor is there any waste of material—these ties can be used 30 and more times without loss of holding power.



When a new room is opened up, a crew of four men can lay this complete Bethlehem turnout in an hour-and-a-half—a quarter of the time required for older types. It comprises three special steel switch ties, the balance Bethlehem No. 3 steel ties; closure rails furnished cut to length, accurately bent; switch points and Design 289 frog.

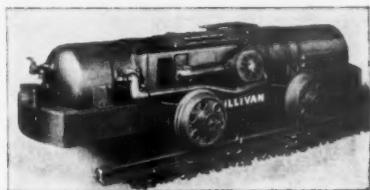


BETHLEHEM STEEL COMPANY

With the Manufacturer

Mine Car Compressor

The Mine-Air is a newly developed mine car compressor built by Sullivan Machinery Company. It is completely modern and offers greater convenience and higher efficiency than was previously obtainable. It is low, compact, rugged; it is cool; it gives high air delivery in proportion to power consumption; its operation is practically automatic and trouble free; and it stays on the rails.



Sullivan Machinery Company has built fine portable underground compressors for 30 years. Extensive field and manufacturing experience augmented by modern engineering design make the Sullivan Mine-Air a compressor said to be far in advance of any previously developed for underground use. Ask for Bulletin A-19, Sullivan Machinery Company, Michigan City, Ind.

Lifting Jack Catalog

The Duff-Norton Manufacturing Company, Pittsburgh, Pa., announces the publication of a colorful and well illustrated new catalog describing their complete line of lifting jacks for mine, railroad and industrial use.

Copies of this handy and informative new catalog are available by addressing this magazine or by writing the manufacturer direct.

New Booklet Answers Dust Questions

The Mine Safety Appliances Company, Braddock, Thomas and Meade Streets, Pittsburgh, Pa., has recently issued a new booklet entitled, "Pertinent Questions and Answers Concerning Dusts."

In view of the widespread interest in the harmful effects of breathing dusts, especially those containing free silica (producing silicosis), and because of the added stimulation created by Federal agencies and state work in industrial hygiene, considerable material has been published on this subject. However, it has been presented in terminology and language that is either meaningless to most persons, or creates a good deal of misunderstanding.

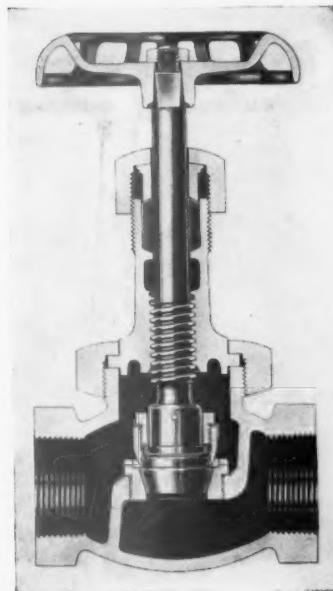
The new M. S. A. booklet, therefore, endeavors to answer some of the im-

portant questions that arise continually regarding the nature and effects of dusts, in simple and insofar as possible, non-technical language.

Copies are available either by writing this publication, or by addressing the manufacturer direct.

Plug-type Valve Seat

Jenkins Bros. has just announced its Fig. 976 Plug-Seat Valve that features a plug and seat ring made of Jenkins JX500, a superior stainless steel having a Brinell hardness in excess of 500. This valve is specially recommended for severe service such as continuous throttling for pressure reduction or free blow duty such



as soot blowers, injectors, heating coils, or any steam line where close regulation is required. Jenkins states that their JX500 plug and seat practically nullify wear and almost entirely eliminate danger of wire drawing and cutting.

In a folder on the Fig. 976 Valve, Jenkins Bros. answers the question, "How hard is 500 Brinell?" by comparison with the hardness of some substances that get into pipe lines. They list boiler scale, pipe chips, welding heads, rust tubercles, and iron oxides as under 500 Brinell, therefore not able to even scratch this new Jenkins valve seat. By contrast, a common nail is shown to be under 200 Brinell hardness.

The descriptive folder can be obtained by writing Jenkins Bros., 80 White Street, New York.

UCC Gas Indicators

The Linde Air Products Company announces a new line of gas indicators, developed for quickly and easily detecting explosive or irrespirable gas-air mixtures, the UCC gas indicators. These instruments are designed to fulfill the requirements of public utilities, gas plants, shipping companies, petroleum companies, paint and lacquer companies, solvent manufacturers, fire departments, and insurance companies for locating underground leaks, establishing purge-end points, and determining hazardous conditions in manholes, oil tankers, oil storage tanks, holds of ships, sewers, conduits, and tunnels.

UCC gas indicators are available in three models. The UCC combustible gas indicator model 12-B is for the detection of combustible gases or vapors. A graduated meter scale indicates by direct reading whether combustible gases are present, and, if they are, whether concentrations are above, within, or below explosive limits. For increasing the utility of this instrument, a flame-type safety lamp attachment is available which makes it additionally possible to detect oxygen deficiencies.

The UCC all-service indicator model B-1 combines three units in one. It shows the presence of combustible gases, indicates an oxygen deficiency, and, in addition, includes a toxic chamber for determining the presence of carbon monoxide and hydrogen sulphide in dangerously toxic concentrations.

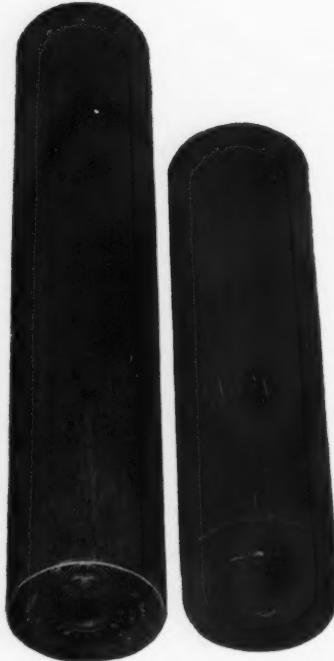
Both the combustible gas indicator and the all-service gas indicator are equipped with a patented and exclusive air-dilution valve. By means of this valve, incoming samples can be diluted with any volume of air, thus making it possible to detect flammable conditions which might not otherwise be indicated due to a lack of oxygen. It also permits following a complete purging operation from start to purge-end point with the use of inert gas as a purging medium. It is indispensable in locating underground leaks when the concentration in bar holes is above the lower limit of flammability.



Permissible Blasting Units

The Portable Lamp & Equipment Co., 72 First Ave., Pittsburgh, Pa., has just introduced two permissible single shot blasting units which bear the official approval of the United States Bureau of Mines.

They were made and approved to meet the new provisions of the Bituminous Mining Code of the Pennsylvania Department of Mines, Rule 97.



The devices consist of wooden cylinders, slightly under 2 in. in diameter, and 9 1/2 in. and 7 in. in length, and containing three or two No. 950 Eveready Unit Cells, respectively. A cap, sealing pin and sealing wax hold the unit together. Spent cells may be removed and new ones inserted.

The manufacturer will be pleased to furnish complete information on request.

New Belt Conveyor Carrier

Stephens-Adamson Mfg. Co., of Aurora, Ill., announce a new lightweight ball-bearing belt conveyor carrier with several features of special interest.

The lightweight, rigid, truss-type frame is supported on two parallel pipes instead of the conventional structural steel or bulky timber stringers. Carrier brackets are clamped to the pipes without boring holes, and carriers can be shifted whenever necessary. By using standard piping, a light, sturdy conveyor frame can be quickly and inexpensively assembled from materials obtainable anywhere. An ingenious rocker type of mounting permits the carrier to tilt in either direction with the travel of the belt. In this way, even a reversible direction belt is centered on the carriers without the use of

guide rollers. Permanently sealed, cartridge-type ball bearings are used to increase bearing life and reduce maintenance costs.

Self-Sealed Bearings

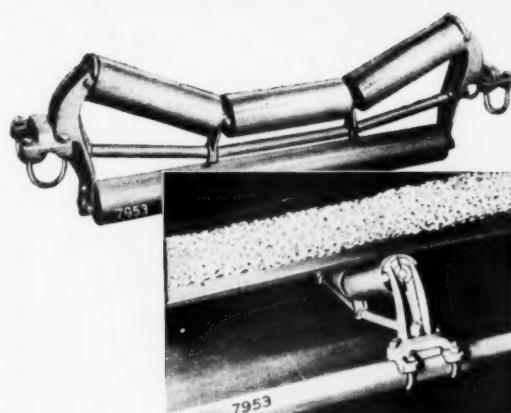
A new 20-page booklet entitled "Sealed" gives the principles involved in the N-D-Seal bearing, and the need for this type of self-sealed bearing. Numerous case histories are cited and illustrated in which N-D-Seals have been used with outstanding success. A review is given of accomplishments of this self-sealed lubricated-for-life ball bearings after 10 years, during which time 10,000,000 have been placed in successful use.

Interested parties may obtain further details by writing for "Booklet D" from New Departure, Division General Motors Corporation, Bristol, Conn.

New Haynes Stellite Cutting Tool

Haynes Stellite Company, Kokomo, Ind., is now offering a new, patented cobalt-chromium-tungsten alloy for metal cutting tools. The new alloy, which is known as "Haynes Stellite-2400", has been developed by Union Carbide and Carbon Research Laboratories, Inc., and Haynes Stellite Company, two units of Union Carbide and Carbon Corporation.

The introduction of the new alloy represents another step forward in cutting tools. Haynes Stellite-2400 tools, having greater edge strength, operate with economical tool life at even higher speeds than Haynes Stellite J-Metal, with no reduction of feeds and depths of cut. Haynes Stellite-2400 cutting tools are marketed in a variety of sizes of solid square and rectangular tool bits, welded tip tools, milling cutter blades, and special small tools to suit requirements. On production operations, this new Haynes



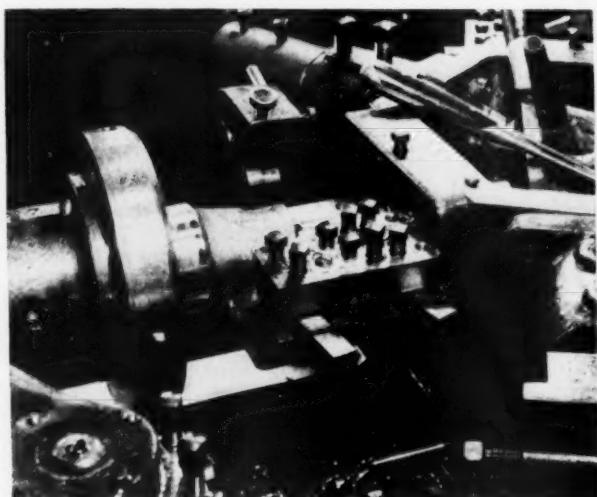
Lightweight belt conveyor carrier.

Stellite alloy has shown marked superiority over tools previously used, including J-Metal.

New Detonating Fuse

The Ensign-Bickford Company, Simsbury, Conn., is now offering a new flexible "detonating fuse" under the registered name of "Primacord," illustrated and described in a new booklet. Explosives experts who have seen and tested this new material are enthusiastic, and several have remarked that they regard it as the greatest development in explosives in recent years.

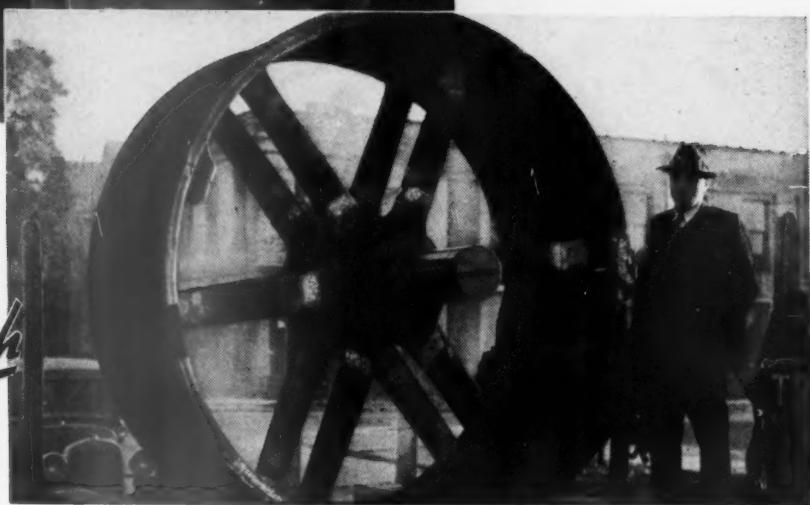
Primacord-Bickford Detonating Fuse has a faster detonating wave than has Cordeau-Bickford. Its fabric covering affords greater flexibility with minimum weight, suitable tensile strength, and excellent waterproof qualities. Thus, it opens up a vast new field for the use of detonating fuse. It is insensitive, and can be handled quickly and easily. Main lines can be laid much closer together than can main lines of Cordeau, as there is no metal covering to cause injury to the adjacent lines through propellant action.



Machining a cast stainless steel valve nozzle with Haynes Stellite-2400.



*In pieces
October 6th*



*Back on
the job
October 12th*

THANKS TO TOBIN BRONZE!

THE whole town of Austin, Pa., depends upon this pulley for food. It turns the wheels of The Bayless Pulp & Paper Company's mill and most everybody in Austin works for Bayless.

Recently, the shaft to this 84" pulley snapped between the two sets of wheel spokes, breaking all twelve spokes away from the hub and all but three away from the rim.

The plant was paralyzed... delivery of a new wheel would take from four to six weeks! Some one suggested welding. The

idea seemed fantastic but the Bayless Company went to Hebler Welding Company, of Buffalo.

The pulley was rushed to Buffalo, repaired with Tobin Bronze, sent back and re-installed—all within six days. Weeks of disastrous shut-down were averted and the cost of a new casting saved.

When difficult welding jobs appear, nothing equals Tobin Bronze! This time-tried Anaconda product carries the trade-mark "Tobin Bronze Reg. U.S. Pat. Off." on each rod. Look for this mark and be sure you're getting genuine Tobin Bronze.



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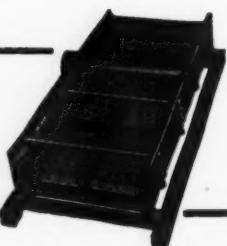
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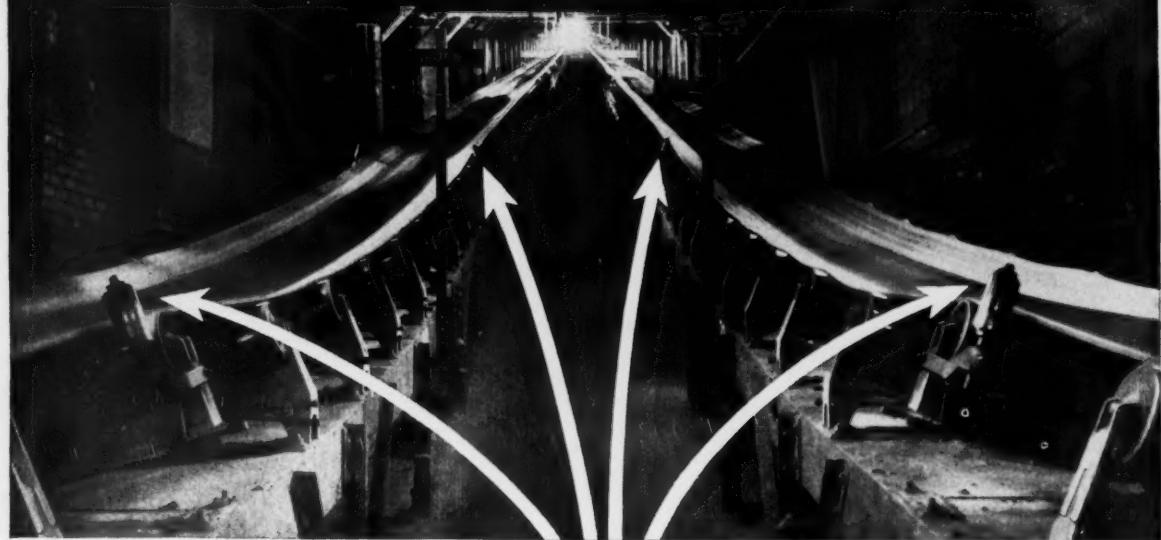
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These are the Link-Belt Positive Self-Aligning Idlers, spaced at suitable intervals, that automatically maintain the conveyor belt in a central carrying position without injury to its edges.



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